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Craner

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- (54) **SYSTEMS AND METHODS FOR CONTENT SURFING**
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See application file for complete search history.

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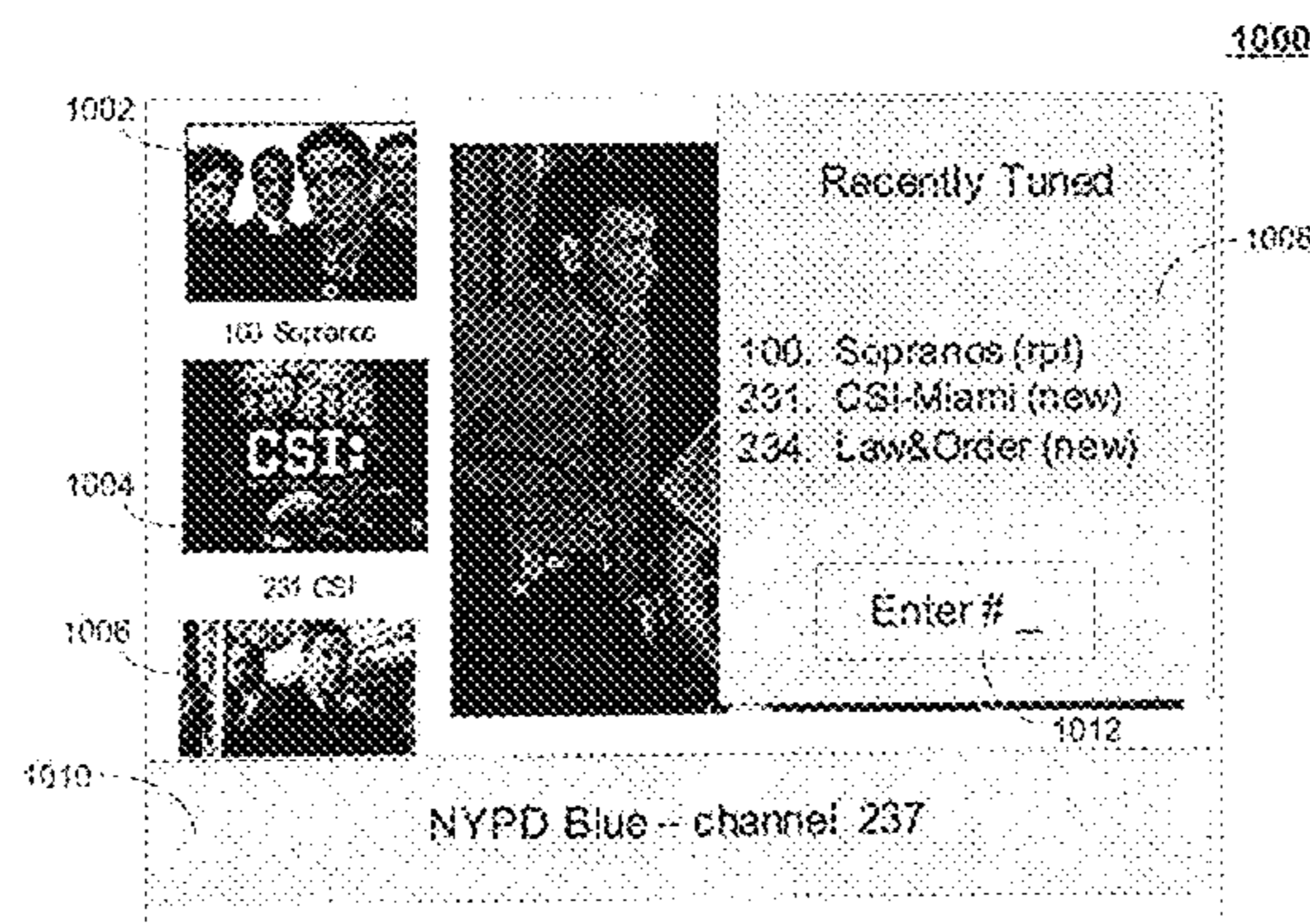
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(57) **ABSTRACT**

Systems and methods for improving or suggesting alternatives to content surfing are provided. When it is detected that a user wishes to surf, a pipeline tuning sequence is implemented where by storing one or more frames of a first content selection to the user equipment and acquiring a subsequent content selection while concurrently displaying the previously stored one or more frames. Content suggestions, program listing grids, media guidance application and tuning hints, advertisements, digital audio, and live video may also be presented to user while content surfing. In some embodiments, content surf landing channels may be anticipated based on user history, user profiles, or any other suitable information. In some embodiments, thumbnails of the user's recently tuned, or paused on, content are displayed to the user while content surfing. In multiple tuner systems, more than one thumbnail may be displayed in full motion video.

16 Claims, 17 Drawing Sheets



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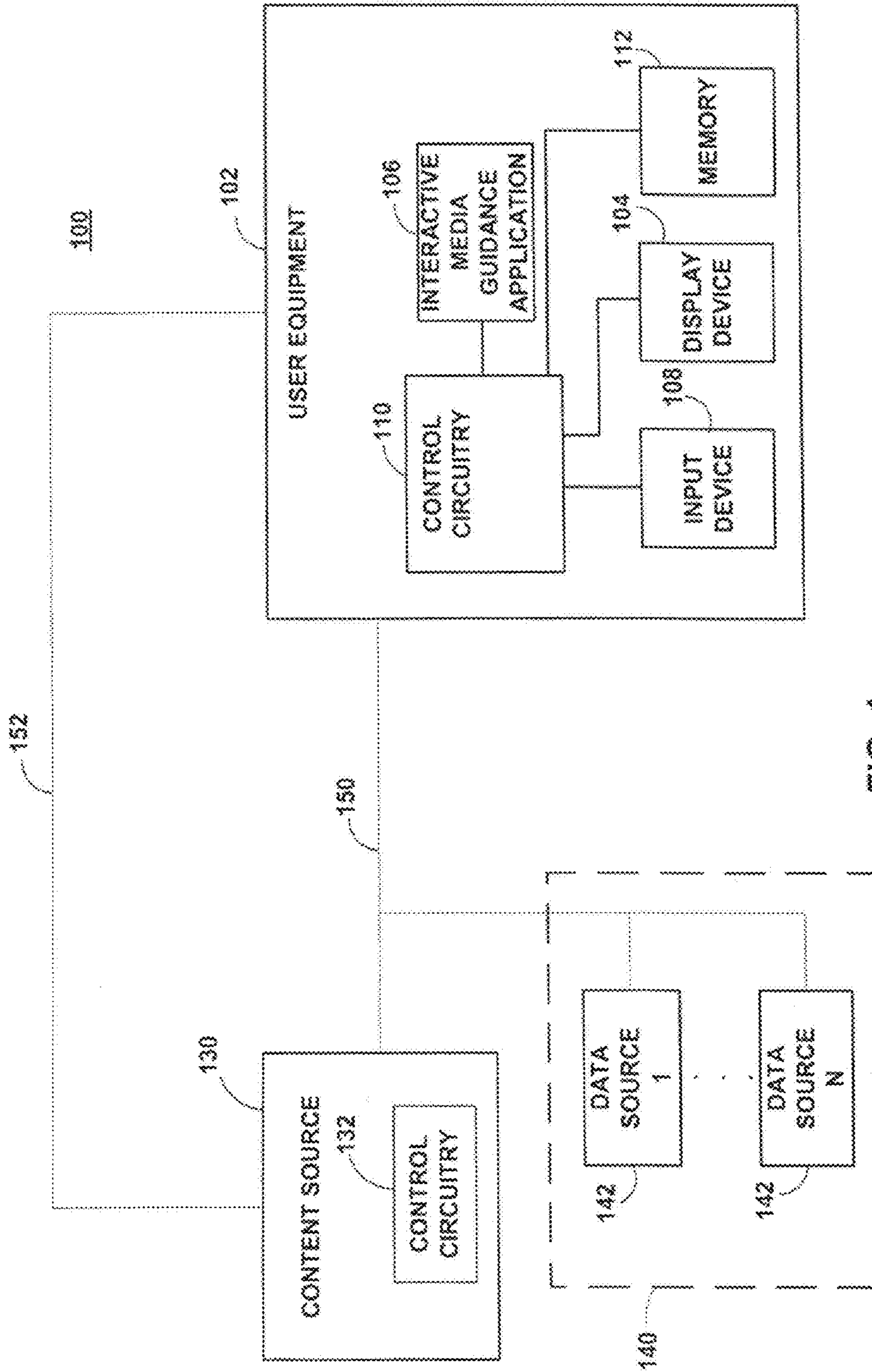


FIG. 1

200

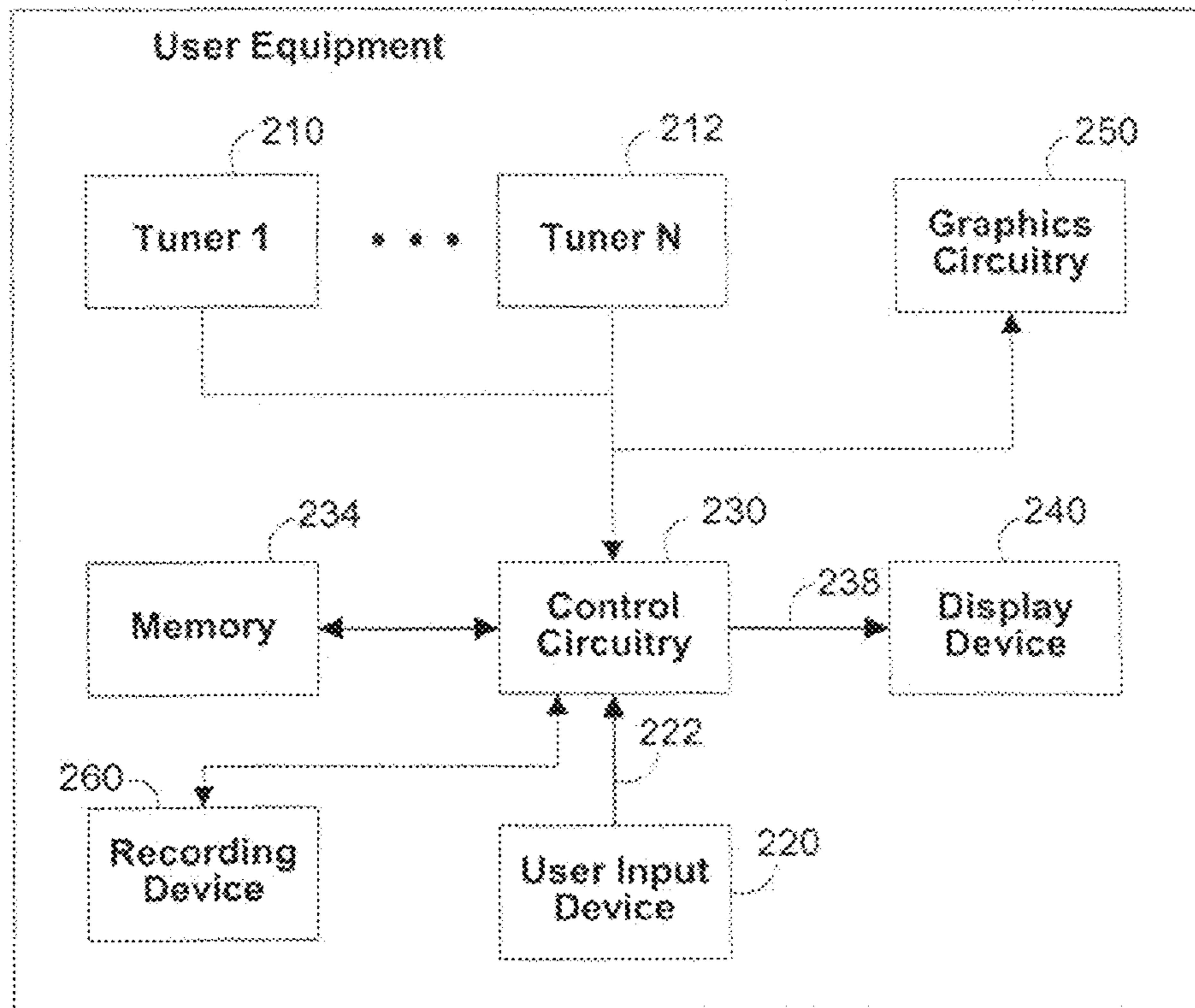
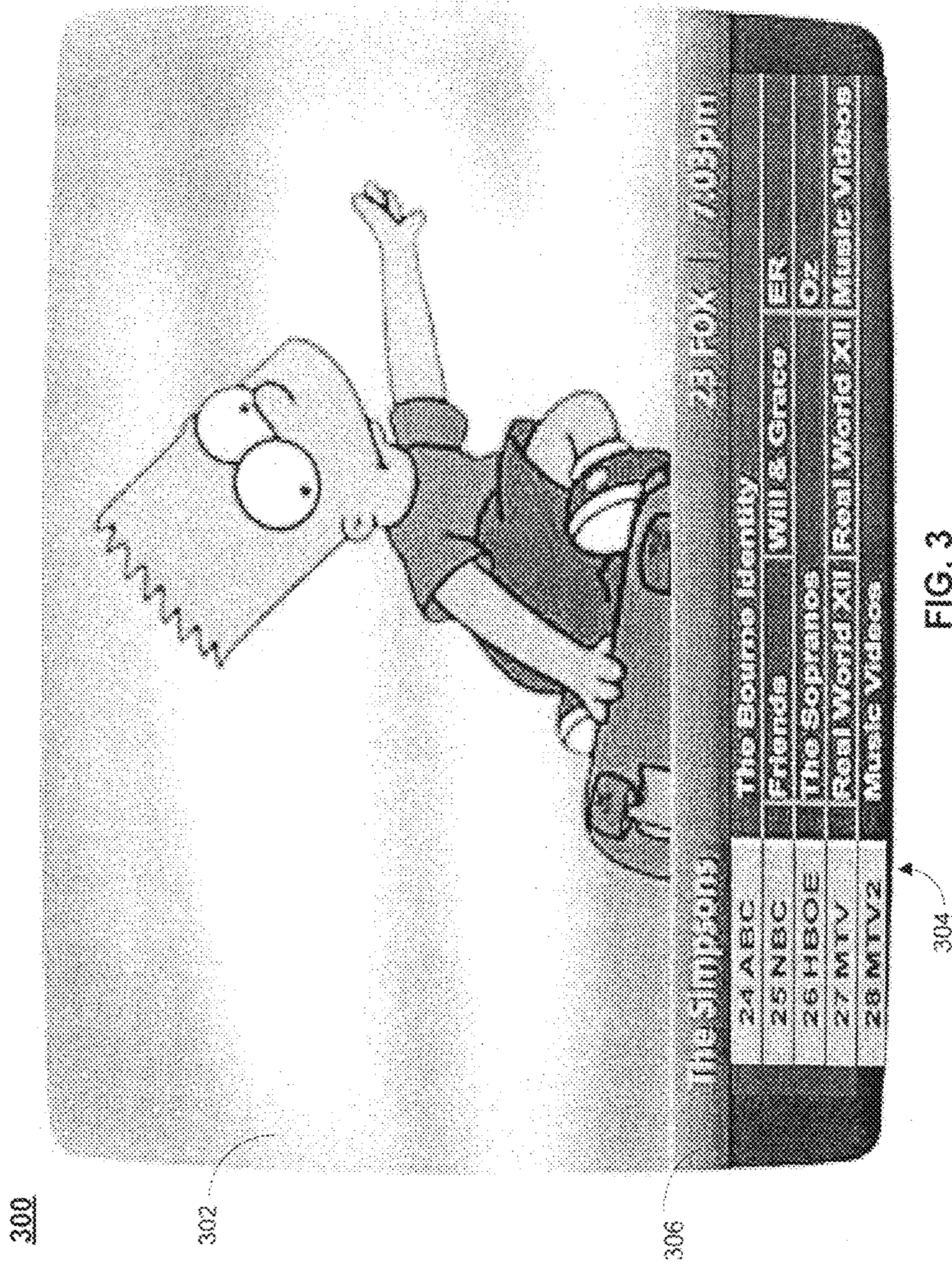


FIG. 2



400

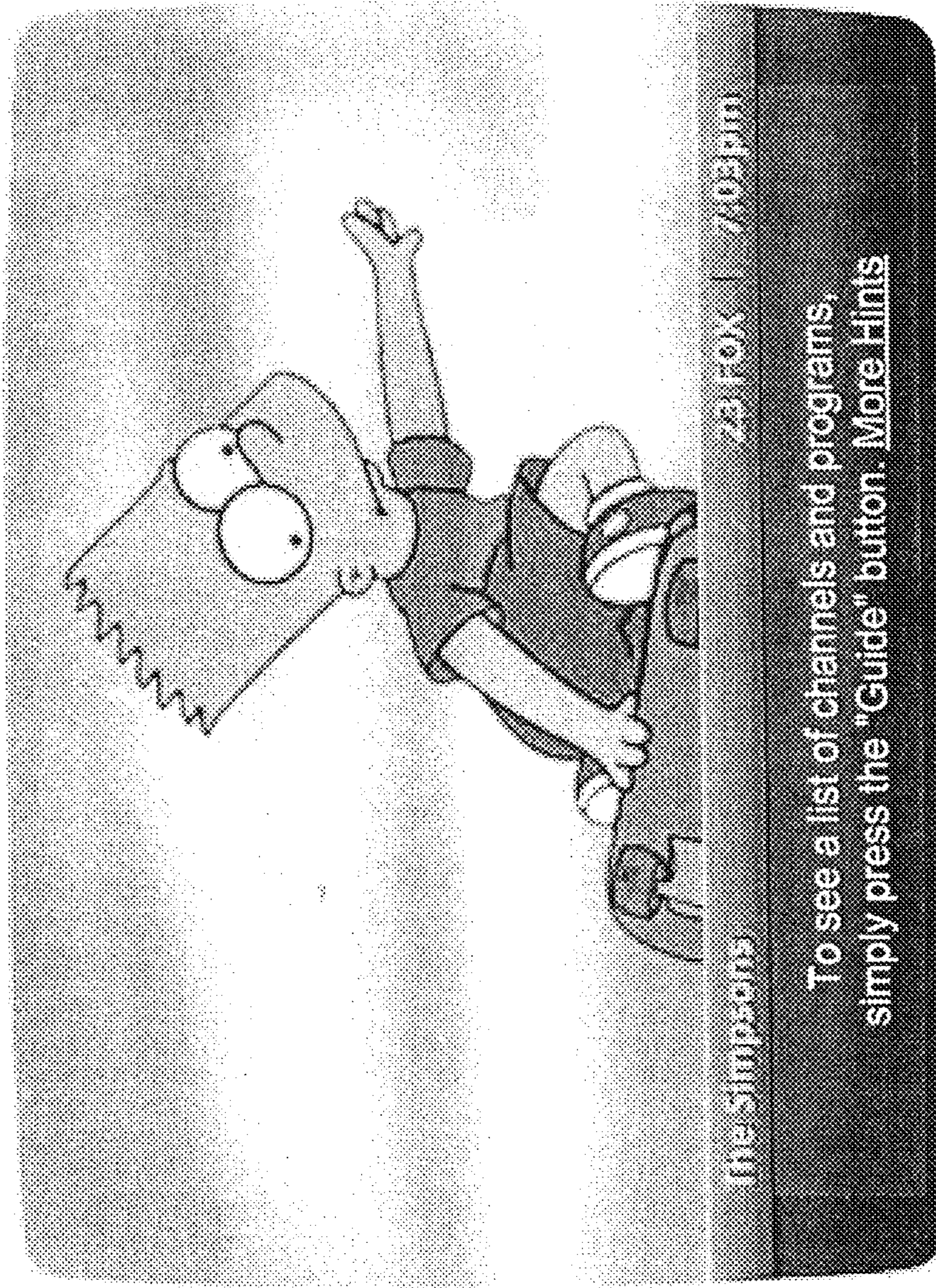


FIG. 4

500

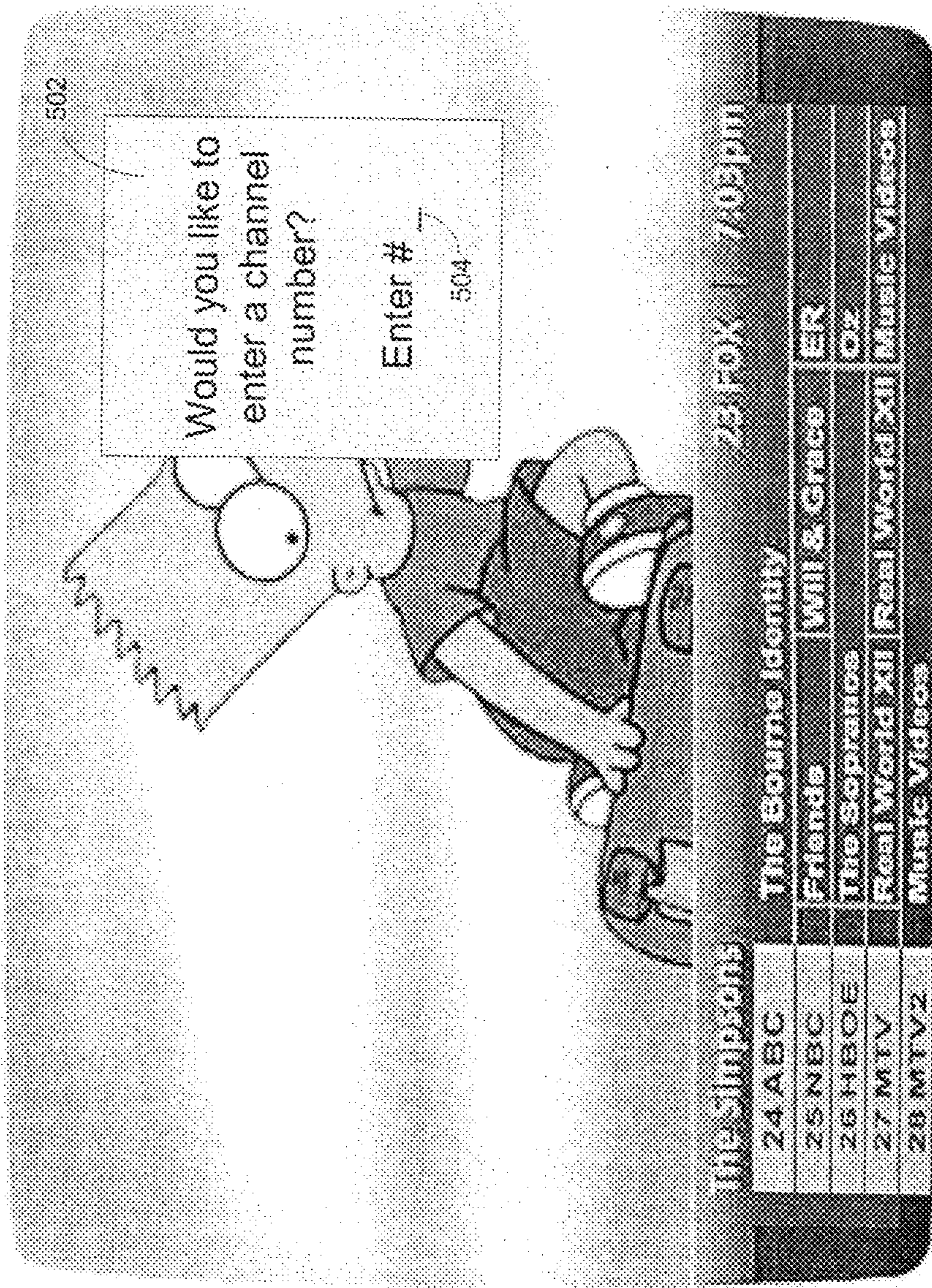


FIG. 5

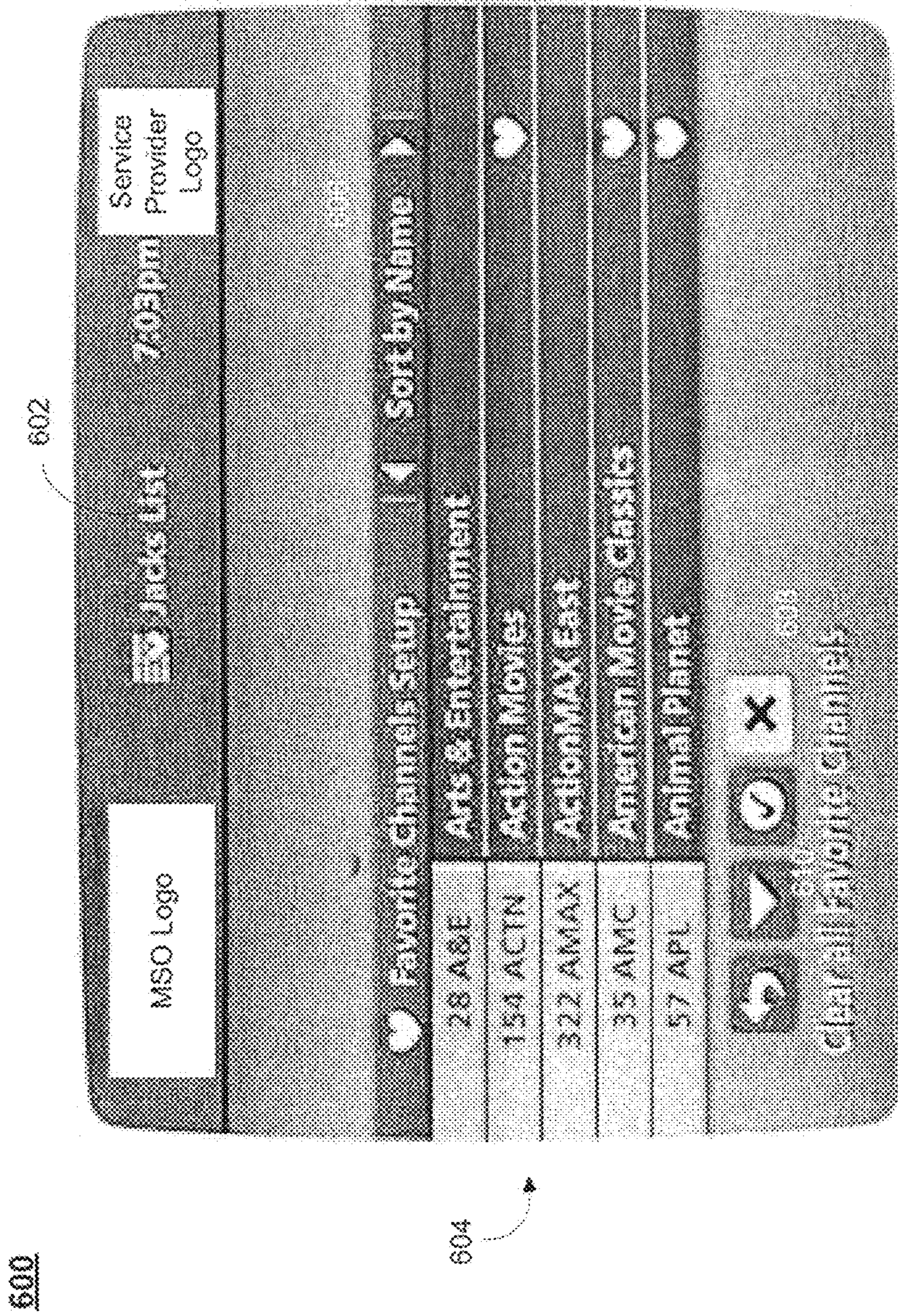


FIG. 6

700

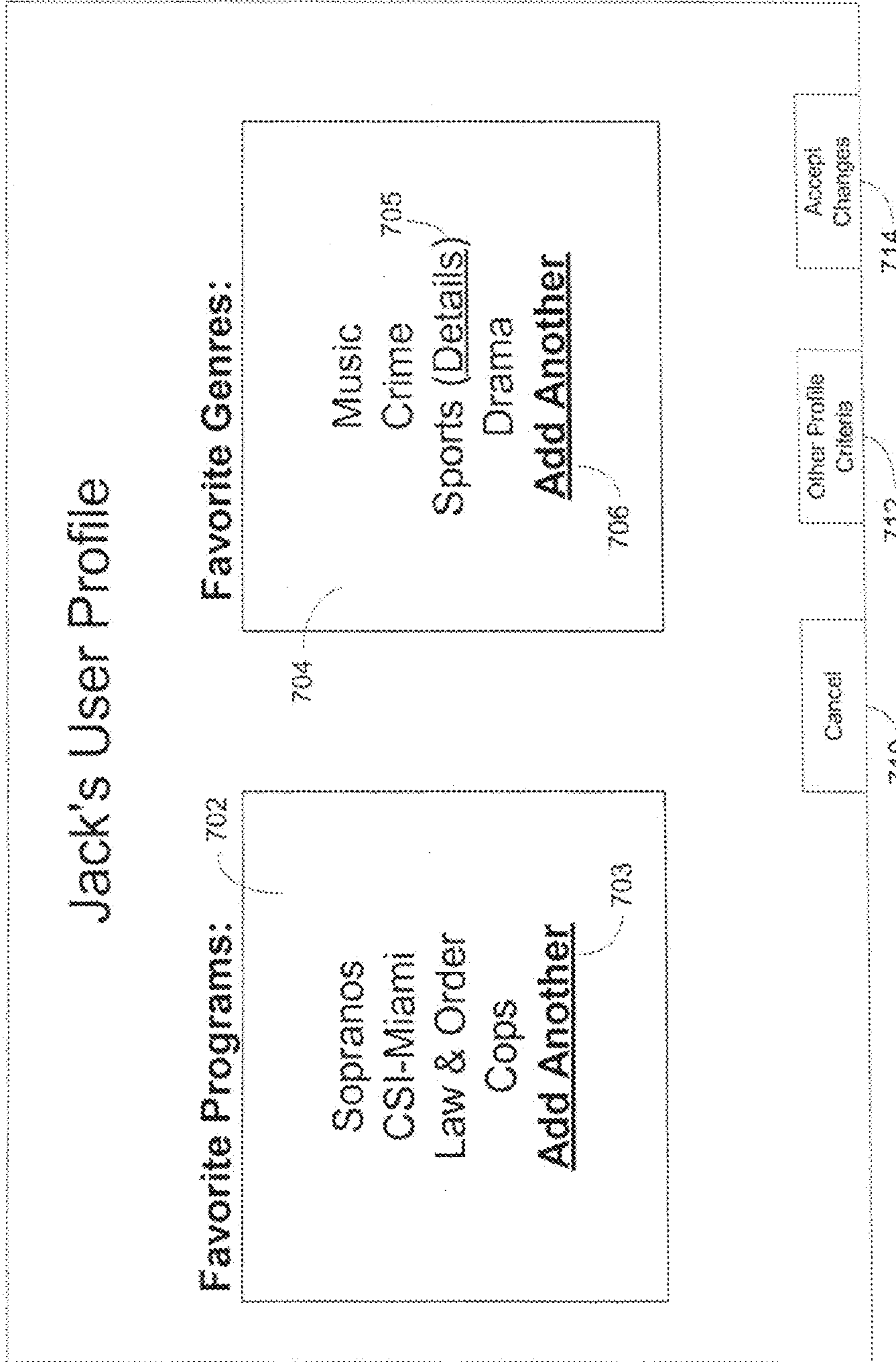


FIG. 7

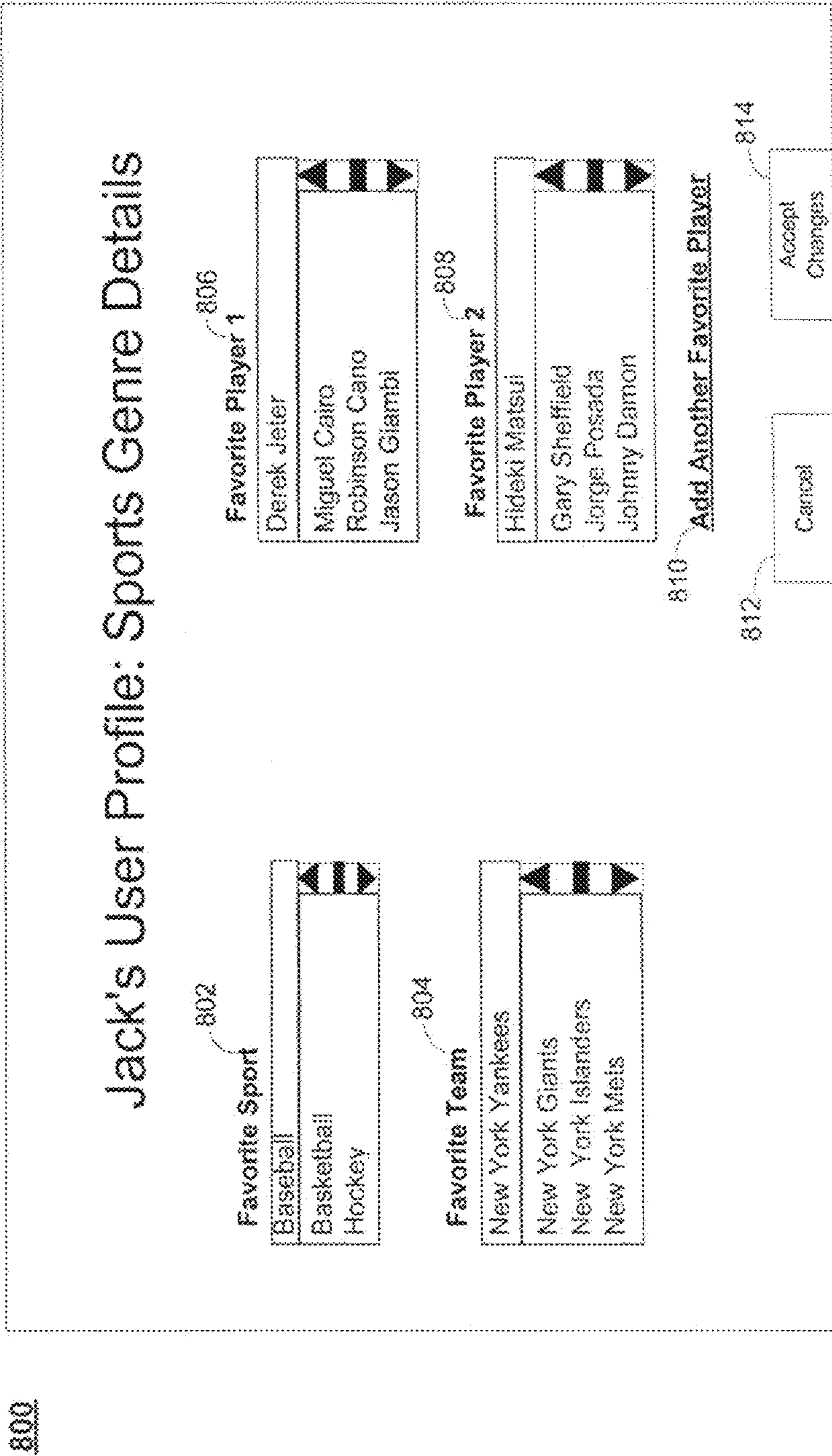


FIG. 8

900

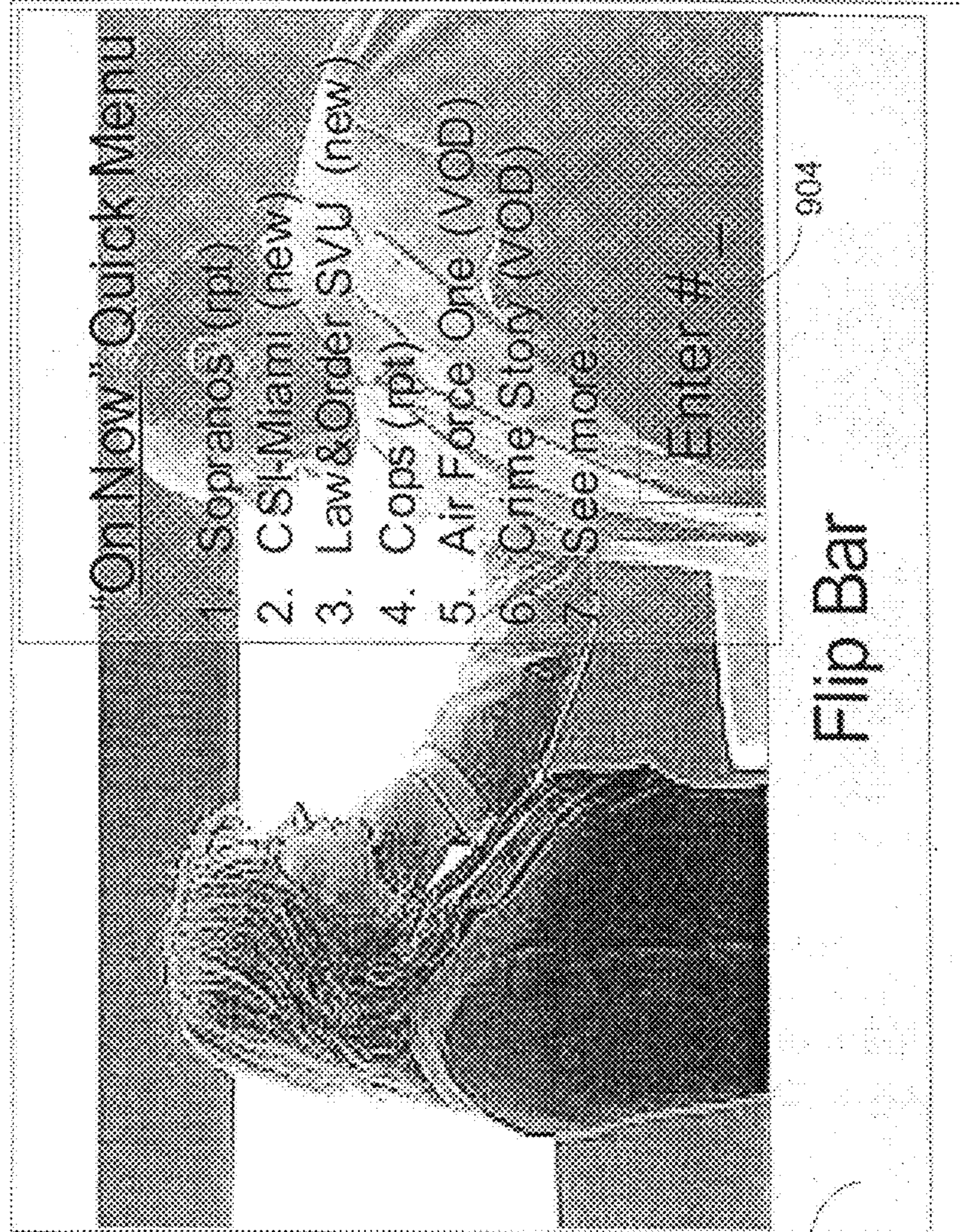


FIG. 9

906

904

902

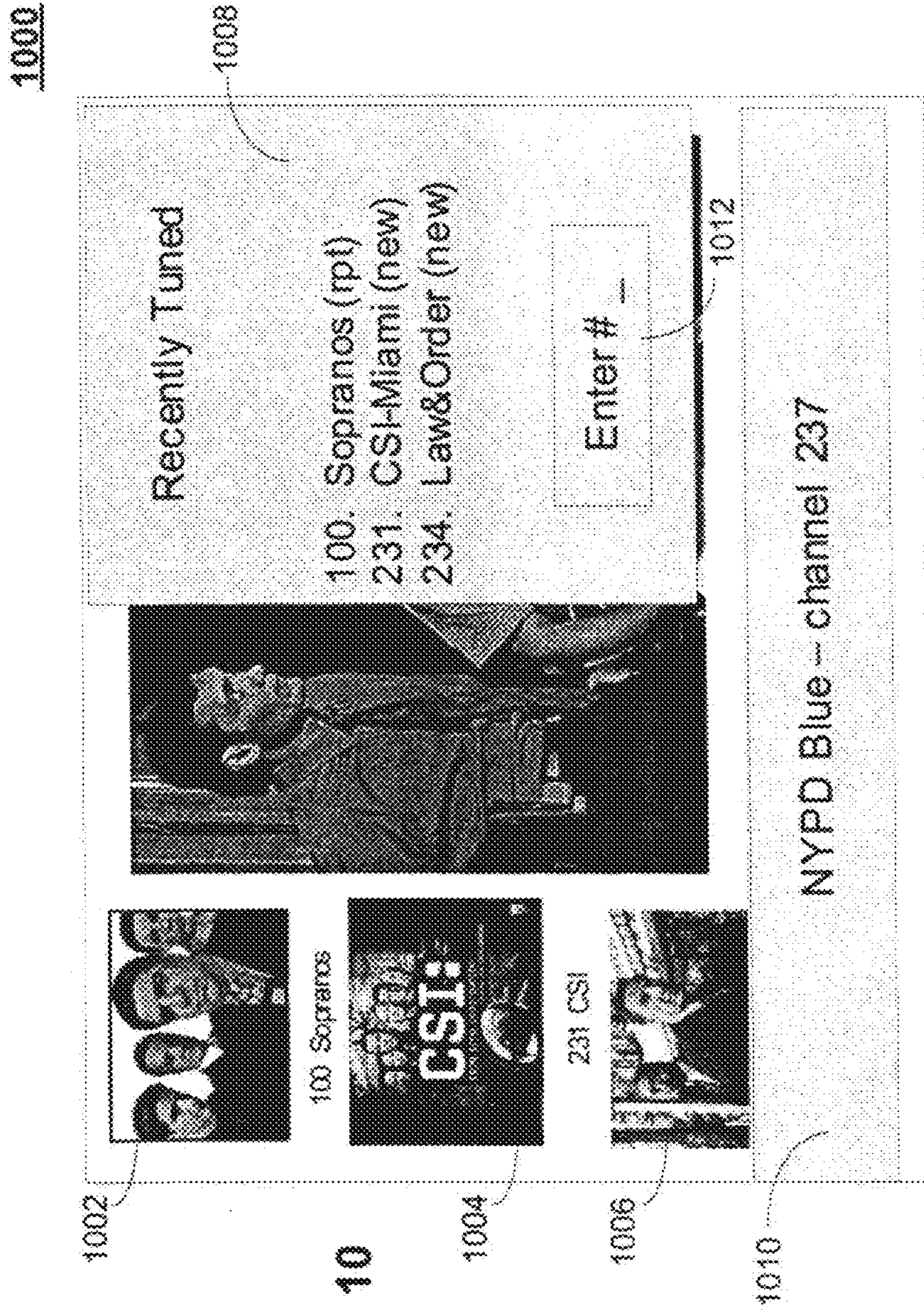


FIG. 10

1100

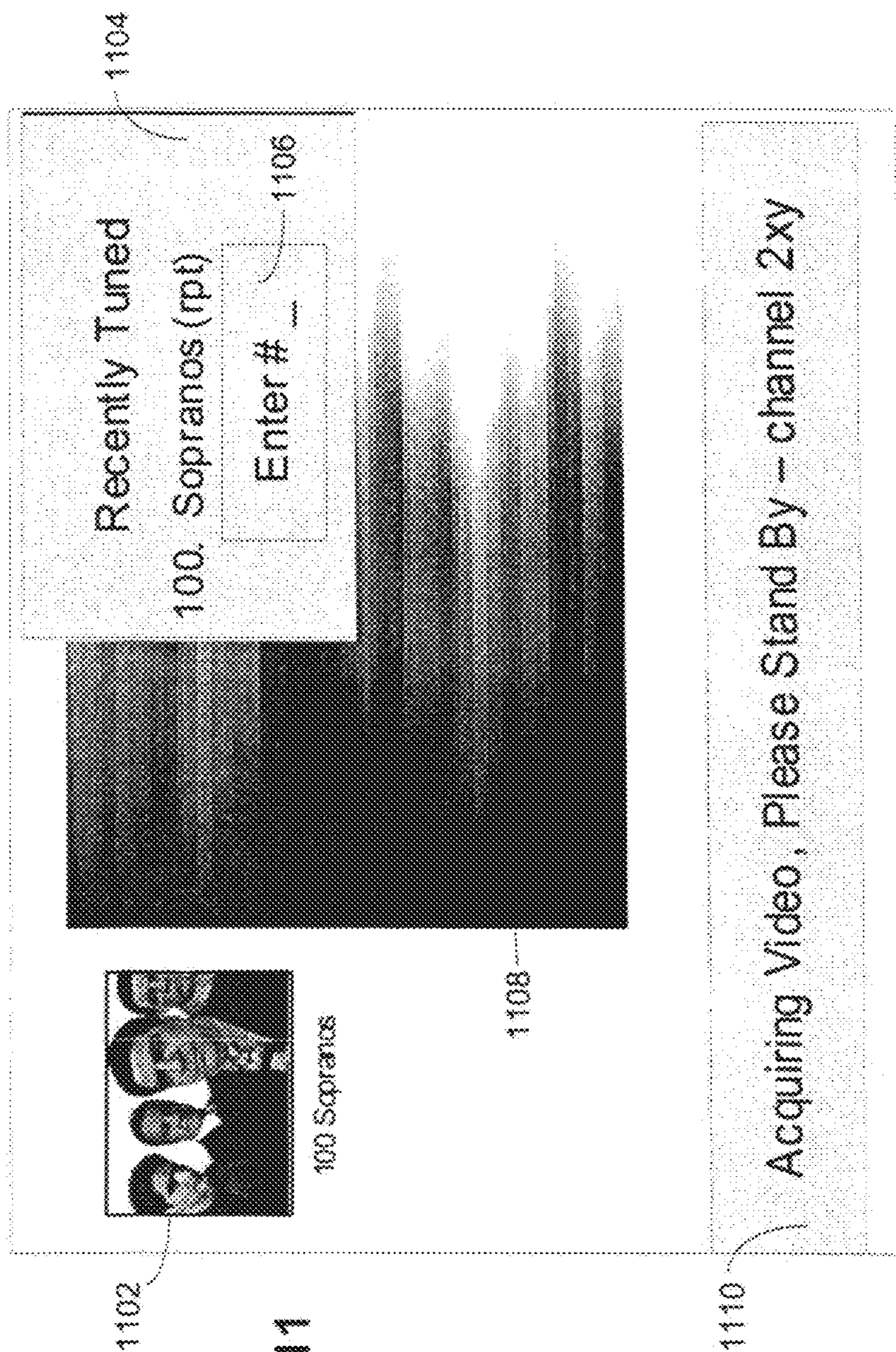


FIG. 11

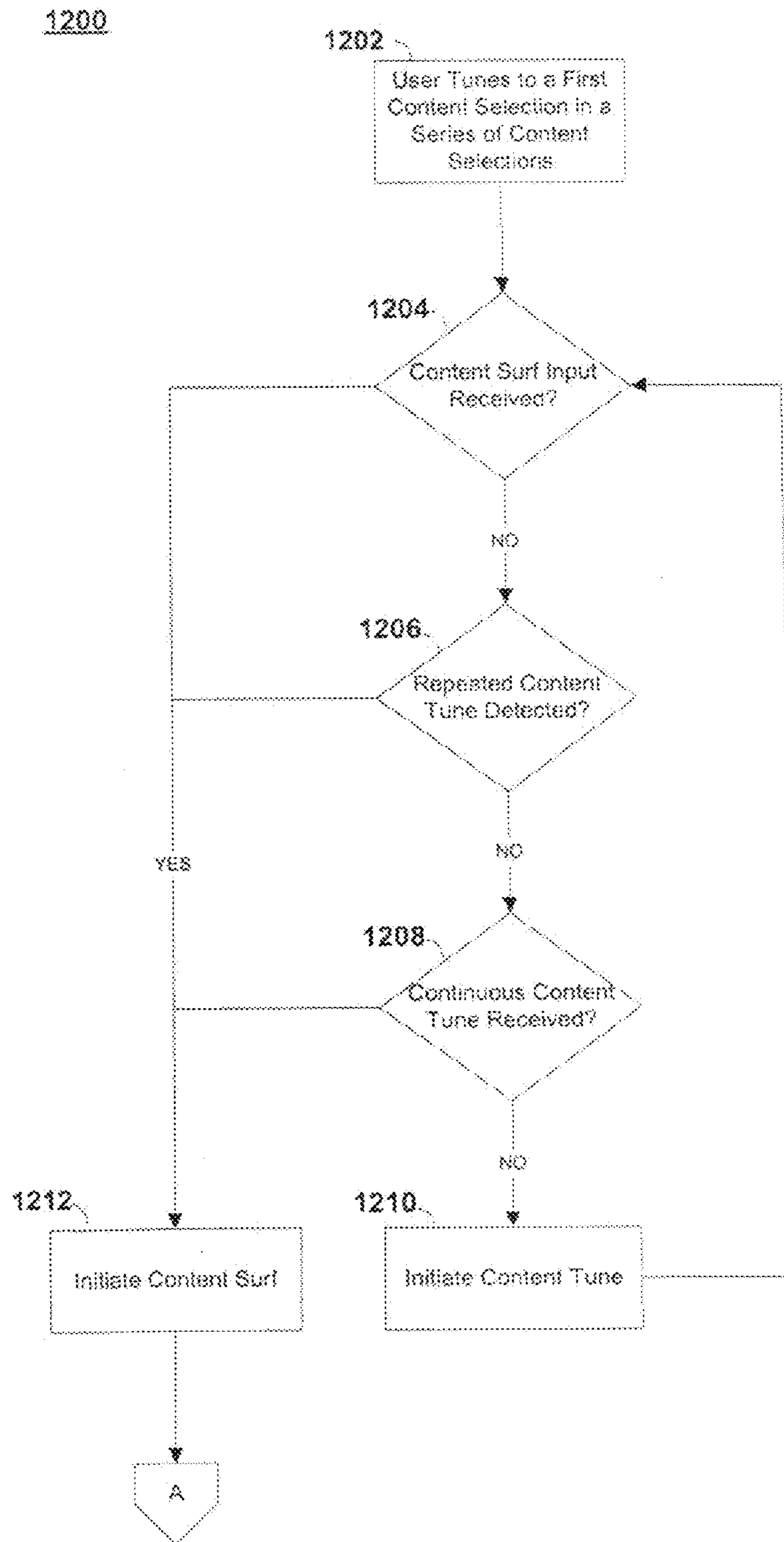


FIG. 12

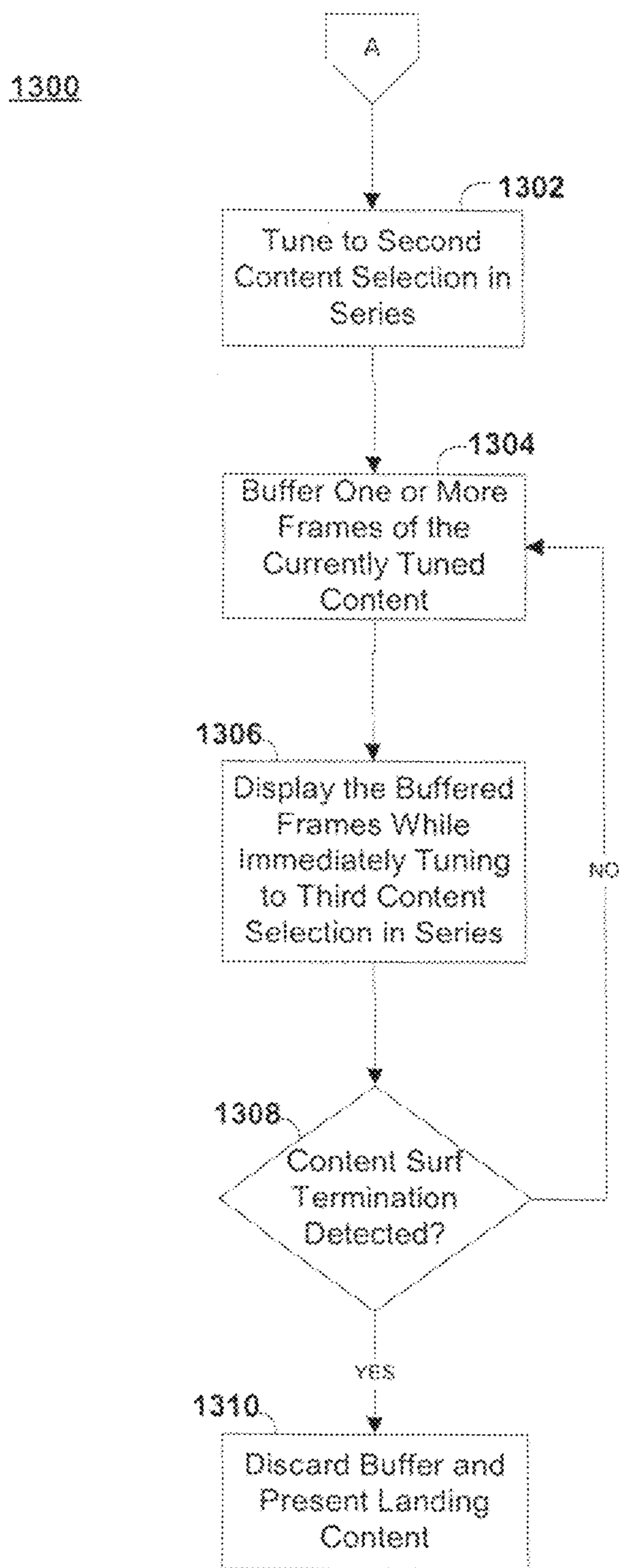


FIG. 13

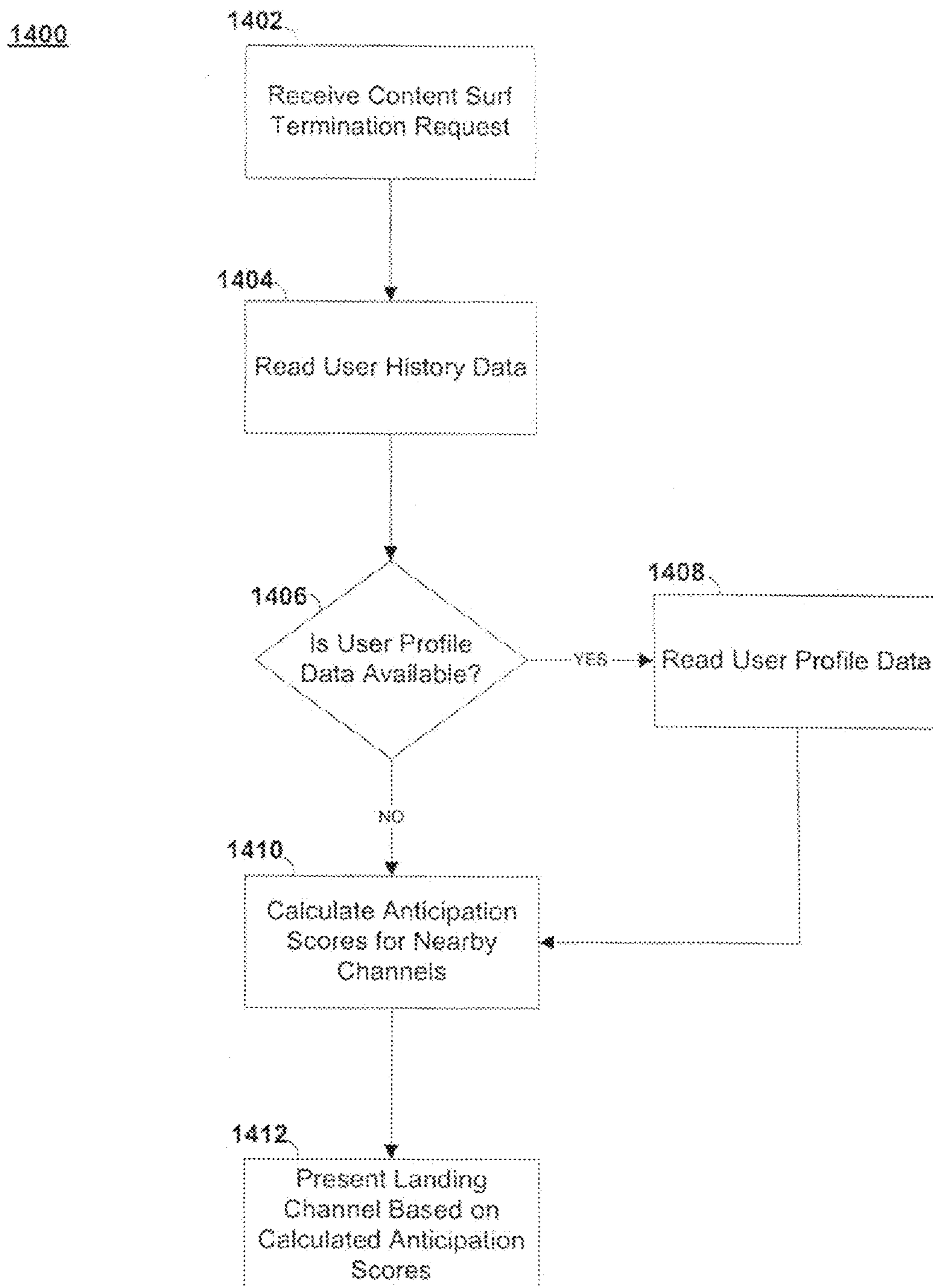


FIG. 14

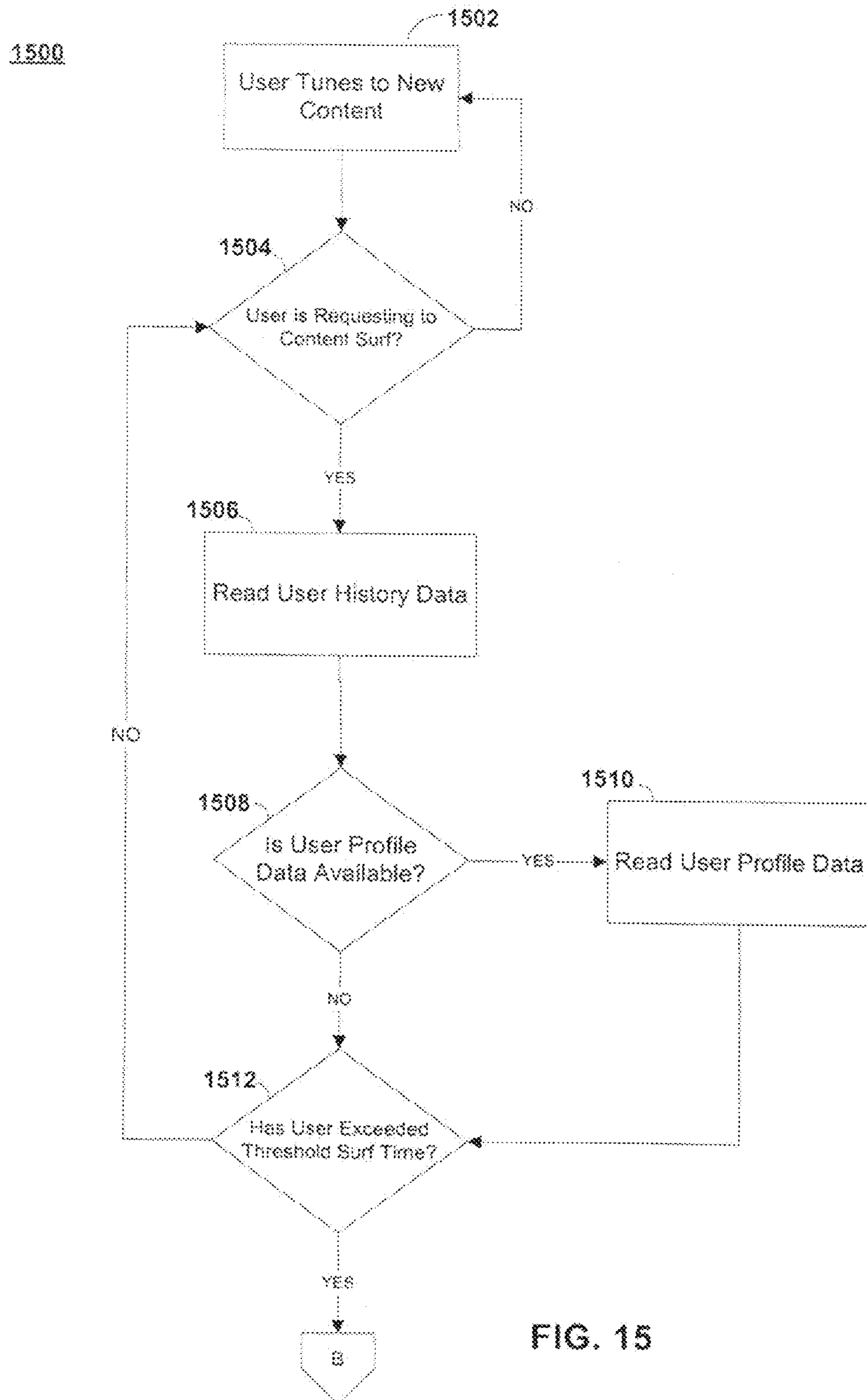


FIG. 15

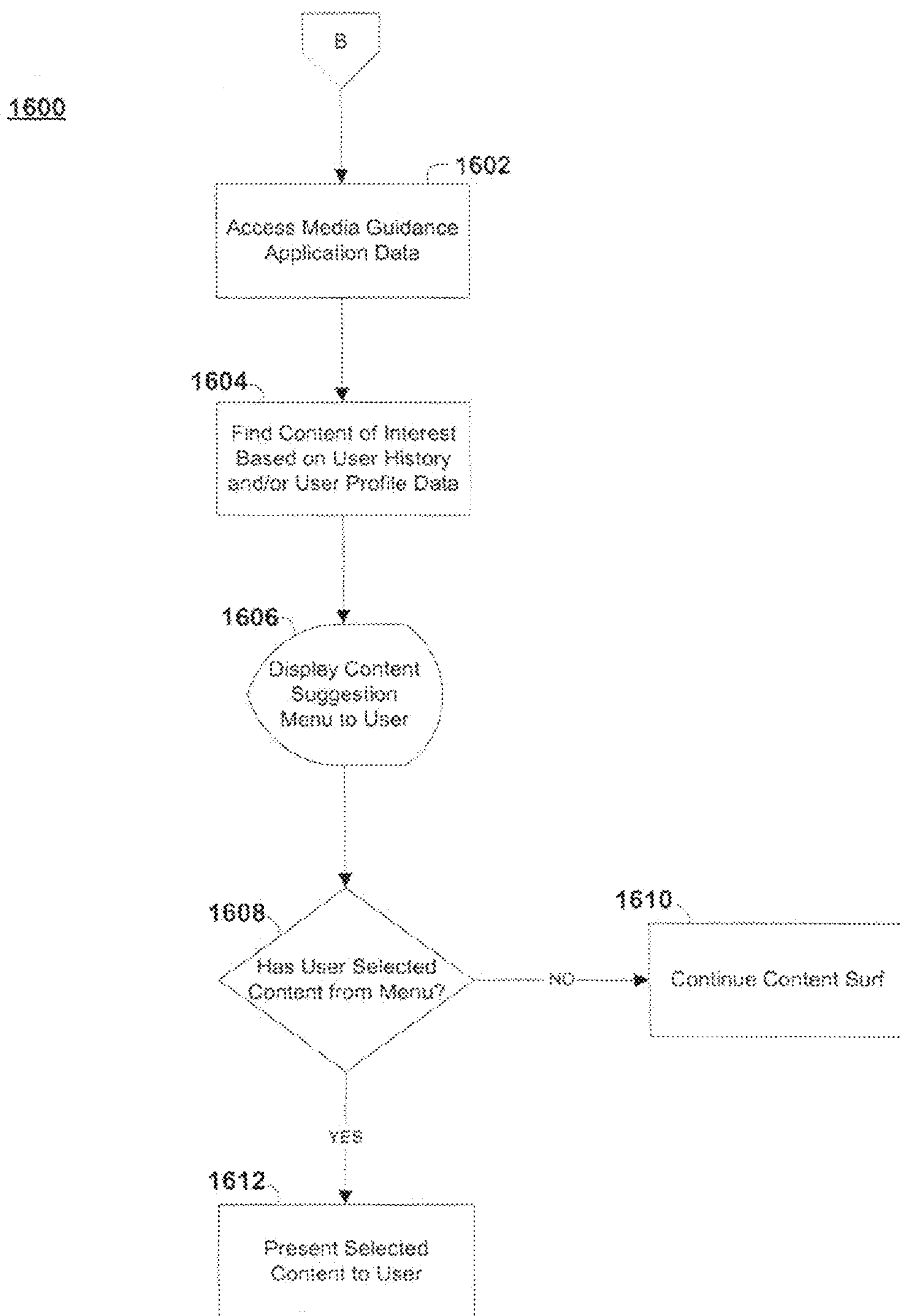


FIG. 16

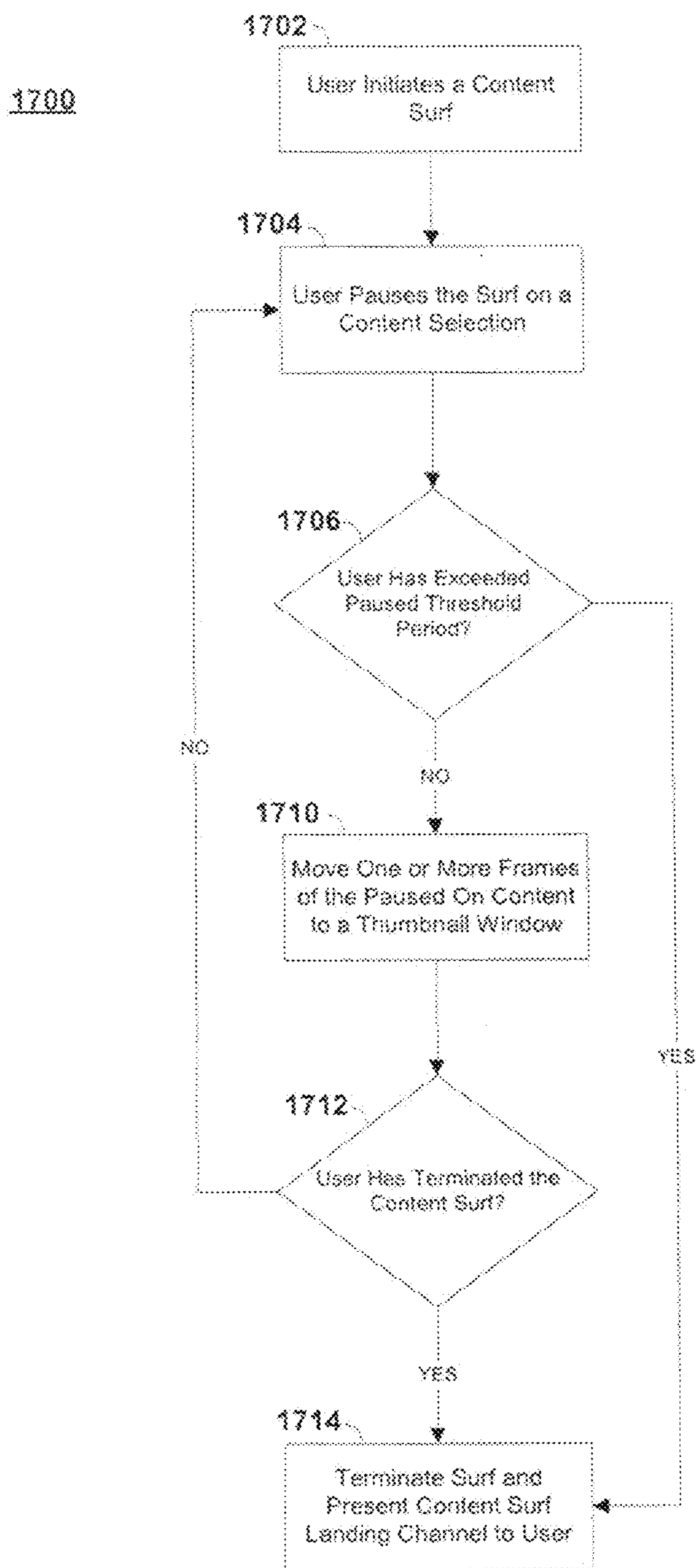


FIG. 17

SYSTEMS AND METHODS FOR CONTENT SURFING

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. patent application Ser. No. 12/581,291 filed Oct. 19, 2009, which is a continuation of U.S. patent application Ser. No. 11/430,468 filed on May 8, 2006 (now abandoned), and which claims the benefit of U.S. Provisional Patent Application No. 60/678,493 filed May 6, 2005, all of which are hereby incorporated by reference herein in their entirety.

BACKGROUND OF THE INVENTION

This invention relates generally to media systems and, more particularly, to enhanced media systems that allow users to surf content.

Current media systems, including, for example, television, audio, and gaming systems, allow users to access a wide array of media content. This content may include movies, television programs, music, news, interactive applications (e.g., interactive games), Internet resources (e.g., website, news-groups, chatrooms), and any other media content capable of being presented on user equipment. The content may be presented on hundreds of on-demand and broadcast channels, as well as from attached storage devices.

However, current media systems are susceptible to delays when navigating through the wide array of available media content. For example, a user may experience a delay of over a second when changing channels on typical user equipment, including digital and analog television equipment. As another example, a delay of several seconds is common when browsing through available content stored on a digital video recorder or attached recording device. These delays may be due, at least in part, to the time it takes the user equipment to decode the media content or broadcast stream.

To help facilitate content navigation, some media systems provide one or more interactive applications, such as an interactive media guidance application, to more easily browse the wide array of available content. The interactive media guidance application may present a grid display to the user containing media content listings. The listings may be part of a comprehensive interactive media guide, allowing the user to see what content is accessible, on what channel, and at what time.

Some users, however, may be unaware of the existence of the media guide or may prefer to surf the actual channels rather than a media guide listing. These users may become frustrated by the frequent delays associated with changing channels and accessing content. The delays are even more vexing when the user is trying to surf quickly in one direction.

Accordingly, it is desirable to provide systems and methods for accelerating content switching in media systems. The systems and methods may reduce the delays associated with content navigation by implementing a content surf sequence.

SUMMARY OF THE INVENTION

These and other objects are accomplished in accordance with the principles of the present invention by providing enhanced user equipment configured to reduce content switching delays. In one embodiment, when the user equipment detects a content surf request, one or more frames of the next content selection may be stored to the user equipment. The user equipment may then immediately tune to the content

selection after the next content selection while concurrently displaying the previously stored one or more frames. This pipeline tuning sequence may be repeated for subsequent content selections until the user has terminated the content surf request.

In some embodiments, the enhanced user equipment may include more than one tuner input. In these embodiments, the tuner inputs may be involved in a round-robin pipeline tuning process, whereby the tuner inputs may take turns tuning to the next content selection in the direction of the content surf.

In some embodiments, content selections may be additionally or alternatively skipped in the direction of the content surf. For example, the user equipment may skip every N content selections, whereby N may be a user-programmable value. The user equipment may then tune to only every Nth content selection. In some of these embodiments, only the first one or more frames of the Nth selection are stored in memory on the user equipment, and a pipeline tune is implemented. The one or more frames of the Nth selection may be displayed to the user while concurrently tuning to the next (e.g., N+Nth) content selection.

The enhanced user equipment may also provide content suggestions to the user while content surfing. After a user has been content surfing for a user or system-specified period of time, a minimally-intrusive menu of content suggestions may be presented to the user. This menu may contain content listings for media that is currently (or shortly) accessible by the user equipment. In addition, the suggested content listings may be chosen based, at least in part, on user preferences, user profile data, user behavior, or user history. In addition to presenting a listing of content suggestions, each content listing in the menu may be associated with a quick dial number or link to the actual content. When a user inputs the quick dial number or selects the link, the user equipment may automatically present the corresponding content on the user equipment.

In some embodiments, hints to more efficiently navigate content are presented to the user when a user enters a content surf. The hints may include instructions on use of an interactive media guidance application or details of the search system operation. In some embodiments, the hints appear in the flip bar area or as unobtrusive overlays that do not interfere with the content surf.

In some embodiments, a stored graphic, video, or digital audio may be presented to the user while the user is content surfing. This stored content may include low resolution content stored in a circular buffer that emulates a fast tuning sequence while the user surfs to new content. In some embodiments, the user equipment may also anticipate the user's ultimate landing channel or content based on, at least in part, user preferences, user profile data, user behavior (e.g., the intensity or frequency of the up/down channeling), or user history.

The enhanced user equipment may also present advertising while the user is content surfing. Advertising may include locally-stored images, graphics, text, and video with links to purchase order forms, websites, and more information related to the product or service being advertised. Advertisements may be presented to the user in an unobtrusive manner so as to not interfere with the content surf.

In some embodiments, one or more thumbnail windows containing still frames, box art, video clip loops, or live video of one or more recently tuned channels or content may be presented to the user while content surfing. The thumbnail windows may represent a visual map of where the user has paused during the current content surf. If more than one tuner is available in the user equipment, live video of the user's

most recently paused on channels or content may be presented to the user in the thumbnail windows until the user terminates the content surf. In some embodiments, a user may select any thumbnail window to return to the previously paused on content and terminate the content surf. Additionally or alternatively, a menu listing of the user's most recently paused on channels or content may be presented to the user with quick dial numbers associated with each content entry in the menu. When the user inputs a quick dial number, the corresponding content may be automatically presented to the user.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features of the present invention, its nature and various advantages will be more apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, and in which:

FIG. 1 is a diagram of an illustrative interactive media system in accordance with the present invention;

FIG. 2 is a diagram of illustrative enhanced user equipment in accordance with the present invention;

FIG. 3 shows an illustrative surf display screen with content mini-guide in accordance with the present invention;

FIG. 4 shows an illustrative surf display screen with content navigation hints in accordance with the present invention;

FIG. 5 shows an illustrative surf display screen with a channel number prompt in accordance with the present invention;

FIG. 6 shows an illustrative user favorite channels surf display screen in accordance with the present invention;

FIG. 7 shows an illustrative user profile display screen in accordance with the present invention;

FIG. 8 shows an illustrative user profile genre details display and setup screen in accordance with the present invention;

FIG. 9 shows an illustrative surf display screen with a content suggestions menu in accordance with the present invention;

FIG. 10 shows an illustrative surf display screen with a recently tuned content overlay and content thumbnail windows in accordance with the present invention;

FIG. 11 shows an illustrative surf display screen with a recently tuned content overlay and content tuning message in accordance with the present invention;

FIG. 12 is a flow chart depicting an illustrative process for detecting a content surf request in accordance with the present invention;

FIG. 13 is a flow chart depicting an illustrative process for pipeline tuning in accordance with the present invention;

FIG. 14 is a flow chart depicting an illustrative process for anticipating a user's landing channel at the conclusion of a content surf in accordance with the present invention;

FIG. 15 is a flow chart depicting an illustrative process for preparing a content suggestions menu in accordance with the present invention;

FIG. 16 is a flow chart depicting an illustrative process for presenting content suggestions to a user while content surfing in accordance with the present invention; and

FIG. 17 is a flow chart depicting an illustrative process for presenting previously paused on content while content surfing in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The systems and methods of the present invention are directed toward more efficient content surfing in media sys-

tems. Although the embodiments described below may refer to channel switching in broadcast digital or analog television systems, it is to be clearly understood that the systems and methods of the invention may be used with any suitable video or audio content (e.g., on-demand or recorded content) and in any suitable media system (e.g., satellite, on-demand, and IPTV system). As used herein, content or channel "surfing" refers to quickly progressing through a series of content selections or channels (e.g., a quick progression up or down through a number of channels whether or not those channels are contiguous).

As also used herein, the term "tune" or "tuning" refers to the preparation of acquisition of a specific content stream or content selection accessible by the user equipment. For traditional analog television systems, tuning may include acquiring or locking onto a particular channel carrier frequency. For digital television systems, tuning may include demodulating the digital carrier frequency, FEC decoding the demodulated transport stream (TS), demultiplexing the transport stream, and extracting particular packet identifier (PID) streams. For IPTV, tuning may include opening an IP socket and joining a particular multicast group. For recorded content, tuning may include locating the content on one or more storage device (e.g., by reading FAT information).

FIG. 1 shows illustrative interactive media system 100 in accordance with the invention. User equipment 102 may receive content in the form of signals from content source 130 and/or data sources 140 over communications paths 150 and 152, respectively. Any suitable number of users may have user equipment, such as user equipment 102, coupled to content source 130 and data sources 140. For the clarity of the figure, however, the user equipment of only a single user is shown. In addition, although in practice there may be numerous instances of content source 130, for clarity only a single content source is shown in FIG. 1.

Content source 130 may be any suitable content source such as, for example, a cable system headend, satellite television distribution facility, television broadcast facility, on-demand server (e.g., video-on-demand (VOD) server), Web server, game service provider (e.g., for local or online gaming), Internet or network access node, or any other suitable facility or system for originating or distributing passive or interactive media content to user equipment 102. Media content that may be provided by content source 130 to user equipment 102 may include broadcast television programming, VOD programming, music, news, interactive applications (e.g., interactive games), Internet resources and web services (e.g., websites, newsgroups, and chatrooms), and any other media content capable of being displayed, presented to, recorded, or interacted with, using user equipment 102.

Content source 130 and data sources 140 may be configured to transmit signals to user equipment 102 over any suitable communications paths 150 and 152, including, for example, satellite paths, fiber-optic paths, cable paths, or any other suitable wired or wireless paths. The signals may be transmitted as a broadcast, switched broadcast, multicast, unicast, or any other suitable transmission stream. Content source 130 may also include control circuitry 132 for performing operations on the signals transmitted by the content source, such as, for example, generating new signals or communicating with user equipment 102 to provide on-demand content and related functionality.

User equipment 102 may receive interactive application data from one or more of data sources 140 and content source 130. Data sources 140 may provide data for a particular type of content or for a particular application running on user

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equipment **102**. For example, one data source **142** may provide data for an interactive media guidance application and another data source may provide data for a home shopping application. In some embodiments, data sources **140** may provide data to the applications running on user equipment **102** using a client-server model. There may be one server per data source, one server for all sources, or, in some embodiments, a single server may communicate as a proxy between user equipment **102** and various data sources **140**.

Content source **130** and data sources **140** are shown in FIG. **1** as separate elements. In practice, their functionality may be combined into a single mechanism and provided from a single system at a single facility, or their functionality may be provided by multiple systems at multiple facilities. For example, content source **130** and data source **142** may be combined to provide broadcast television content and associated broadcast television data or other suitable information.

User equipment **102** may include any equipment suitable for providing an interactive media experience. For example, user equipment **102** may include computer equipment, such as a personal computer with a television card (PCTV). User equipment **102** may also include television equipment such as a television and set-top box, a recording device, a video player, a user input device (e.g., remote control, a keyboard, a mouse, a touch pad, a touch screen, and/or a voice recognition/verification module) or any other device suitable for providing a complete, interactive television experience. For example, user equipment **102** may include a DCT 2000, 2500, 5100, 6208 or 6412 set-top box provided by Motorola, Inc. In some embodiments, user equipment **102** may include a gaming system, a portable electronic device, such as a portable DVD player, a portable gaming device, a cellular telephone, a PDA, a digital music player/recorder (e.g., an MP3 player with recording capabilities), or any other suitable portable or fixed device.

In the example of FIG. **1**, user equipment **102** includes at least control circuitry **110**, display device **104**, user input device **108**, and memory **112**, all of which may be implemented as separate devices or as a single, integrated device. User equipment **102** may also include interactive media guidance application **106**, which, in some embodiments, may be implemented at least partially on control circuitry **110**. In addition to interactive media guidance application **106**, other interactive applications, such as a home banking or parental control application, may be implemented on user equipment **102**. These interactive applications may be configured to direct a tuner in control circuitry **110** to display, on display device **104**, various interactive application overlays and display screens and to provide various interactive application features.

Interactive media guidance application **106** may be configured to display content listings, retrieve content previews, provide content suggestions, and detect a user request to content surf. A user request to content surf may be initiated via input device **108**. In some embodiments, a content surf may be affirmatively requested by the user. For example, "channel surf up" and "channel surf down" buttons may be selected on input device **108**. Upon selecting either of these two buttons, the user may enter surf mode and initiate one or more content surfing sequences (described below). In other embodiments, a content surf may be initiated by interactive media guidance application **106** after some user input criteria has been met. For example, interactive media guidance application **106** may initiate a content surf on behalf of the user after the repeated selection of a traditional channel up or down button on user input device **108** for a user or system-specified period of time. A content surf may be initiated in

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other ways as well. For example, after pressing (and holding) a traditional channel up or down button for certain length of time, interactive media guidance application **106** may determine that the user desires to content surf. This length of time may be customized by the user or fixed by the user equipment.

In some embodiments, the rate of the content surf may be a function of the length of time the user has requested the content surf using input device **108**. For example, if a user holds a channel up button on input device **108** for 5 seconds, the user equipment may content surf at a rate of 5 channels per second. As the user continues to press the channel up button on input device **108**, the rate may increase proportional to the amount of the time the user holds the channel up button. In some embodiments, if the user changes the interaction with input device **108**, the rate may decrease. For example, if the user switches from holding the channel up button to a repeated button selection, the rate may drop back down to 5 channels per second. In some embodiments, the number of channels to skip between tunes is affected by the user interaction with the channel up/down buttons.

Display device **104** may be any suitable device capable of presenting human-perceivable media, such as, for example, a television monitor, computer monitor, LCD display, video projection device, holographic projector, virtual reality simulator, etc. Display device **104** may also be configured to provide audio and other sensory output and may be incorporated into some device of user equipment **102** (e.g., a cellular telephone or music player display).

Control circuitry **110** is adapted to receive user input from input device **108**, execute the instructions of interactive media guidance application **106**, execute instructions from any other applications running on the user equipment, and direct display device **104** to display media content and interactive application display screens and overlays. Control circuitry **110** may include one or more tuners (e.g., analog or digital tuners), encoders and decoders (e.g., MPEG encoders and decoders), processors (e.g., Motorola 68000 family processors), memory, communications circuitry (e.g., cable modem and ATSC 256QAM receiver circuitry), input/output circuitry (e.g., graphics circuitry), connections to the various devices of user equipment **102** (e.g., interactive media guidance application **106** and memory **112**), and any other suitable components for providing analog or digital media programming and interactive application features. In some embodiments, control circuitry **110** may be included as part of one of the devices of user equipment **102** such as, for example, part of display **104** or any other device (e.g., a set-top box, television, and/or video player).

Control circuitry **110** may be connected to memory **112** for storing data from data sources **140** or content source **130**. This data may include data for use by interactive media guidance application **106** (e.g., program listings, schedules, ratings information, and related program information). Control circuitry **110** may also store user profile data, such as, for example, user viewing history data and favorite program lists, in memory **112**. Control circuitry **110** may also be configured to execute the instructions of interactive media guidance application **106** from memory **112**, which may include any type of storage or memory mechanism (e.g., RAM, ROM, hybrid types of memory, hard disks, and/or optical drives).

In at least some embodiments, interactive media guidance application **106** is implemented in software. However, an implementation of software and/or hardware may be used in other embodiments. These arrangements are merely illustrative. Other suitable techniques for implementing interactive media guidance application **106** may be used if desired.

Although in the illustrated embodiment of FIG. 1 interactive media guidance application 106 is internal to user equipment 102, interactive media guidance application 106 may be partially implemented externally to user equipment 102. For example, interactive media guidance application 106 may be implemented at content source 130 and may run using a client-server or distributed architecture where some of the application is implemented locally on user equipment 102 in the form of a client process and some of the application is implemented at a remote location in the form of a server process. In other embodiments, interactive media guidance application 106 may be implemented as a standalone application, subprocess, or class (e.g., in an OCAP environment). In these embodiments, the management and functionality of interactive media guidance application 106 may be invoked directly by another interactive application or the underlying operating system after some user input from input device 108.

FIG. 2 shows illustrative enhanced user equipment 200 in accordance with the invention. In some embodiments, user equipment 200 may include all the functionality, connections to other parts of media system 100, and features of user equipment 102 of FIG. 1. User equipment 200 may be any in-home equipment suitable for providing interactive functionality, such as a suitably equipped television, set-top box, IPTV receiver, digital video recorder (DVR), personal video recorder (PVR), or PCTV equipment. Whatever the chosen equipment, user equipment 200 may include at least user input device 220, control circuitry 230, memory 234, recording device 260, display device 240, one or more of tuners 210 and 212, and graphics circuitry 250.

Communications path 238 may be any suitable display interface such as, for example, RGB, YPrPb, NTSC, a Digital Visual Interface (DVI) or FireWire Interface (IEEE 1394). Communications path 222 may be any suitable wired or wireless path (e.g., an infrared path).

Control circuitry 230 may include a processor, such as a microprocessor, and any other suitable circuitry for providing interactive functionality, including, for example, caching circuitry, video-decoding circuitry, direct memory access circuitry, input-output circuitry, decryption circuitry, and transcription circuitry.

Enhanced user equipment 200 may include one or more of tuners 210 and 212. Although only two tuners are shown in the example of FIG. 2, user equipment 200 may include any suitable number of tuners. Tuners 210 and 212 may include one or more analog or digital tuners, network sockets (for IPTV systems), MPEG encoders/decoders, or other suitable audio/video circuitry. Tuners 210 and 212 may also include decoding/encoding circuitry for converting over-the-air or cable analog signals to MPEG signals for storage or for decoding digital audio and video signals. The tuning and encoding circuitry may be used by user equipment 200 to receive and display, play, or record a particular television, music, or on-demand channel or any other desired audio and video content (e.g., for requested network-based or local digital video recorder playback).

Each of tuners 210 and 212 may be coupled to control circuitry 230. Control circuitry 230 may direct tuners 210 and 212 to tune, acquire, and decode any suitable content accessible by user equipment 200. For example, tuner 210 may be an analog tuner used to acquire analog television signals, whereas tuner 212 may be a digital tuner, used to acquire and decode digital television signals. Control circuitry 230 may store or buffer one or more frames of video from tuners 210 and 212 to memory 234 at any suitable time. In addition, memory 234 may include one or more pre-stored buffers (e.g., circular buffers) of low-resolution audio or video,

graphics, advertising, or any other suitable content. Control circuitry 230 may cause the stored frames, pre-stored buffer, audio, or video to be displayed or presented on display device 240 at any suitable time (e.g., after some user input from user input device 220).

User equipment 200 may also include recording device 260. Recording device 260 may include a hard drive (e.g., one or more ATA, SCSI, IDE, or IEEE 1394 drives), digital video recorder (DVR), personal video recorder (PVR), or any other device capable of storing media content. Control circuitry 230 may access stored content (e.g., programs and movies) on recording device 260 and cause the content to be presented on display device 240 at any suitable time.

In some embodiments, user equipment 200 may also include graphics circuitry 250. Graphics circuitry 250 may include video and/or audio transcoding circuitry, one or more graphics processors, memory, and various display outputs (e.g., S-Video and composite video outputs). Graphics circuitry 250 may also include video compression and scaling codecs or circuitry to scale the input from tuners 210 or 212 (or from some other device, such as recording device 260) to a resolution or size other than the input's native resolution or size. For example, using graphics circuitry 250, the input to tuners 210 and/or 212 may be displayed at a smaller size on display device 240 than their native size in order for program listings information to be presented with the tuner content on the same display screen. As another example, graphics circuitry 250 may present full-motion or still frame thumbnail windows corresponding to one or more tuner inputs on the same display screen. Graphics circuitry 250 may scale one video input at a time or scale more than one video input simultaneously. For example, the inputs of both tuners 210 and 212 may be scaled simultaneously so that these inputs may be displayed together on the same display screen in real-time (perhaps with program listings information, content suggestions, or other suitable information).

After the user affirmatively initiates a content surf or the interactive media guidance application initiates a content surf on behalf of the user (as described above), control circuitry 230 may respond by initiating one or more content surfing sequences. One content surfing sequence includes storing one or more frames of the next content to be displayed (e.g., the next channel in the direction of surfing) in memory 234 and immediately initiating a next content tune. The previously stored one or more frames may be presented on display device 240 while concurrently initiating the next content tune. In some embodiments, control circuitry 230 decodes the one or more frames before storing them to memory. In other embodiments, the one or more frames may be stored in encoded form (if supported by the underlying encoding format).

For example, for digital MPEG-2 streams, the first Intraframe ("I-frame") may be stored to memory 234. This I-frame may contain all the information needed to construct a complete frame of video. For analog signals, a full field frame may be stored in memory 234. After storing the one or more frames to memory 234, a pipeline tuning sequence may then be invoked by control circuitry 230. This pipeline tuning sequence may include immediately initiating a next content tune on one or more of tuners 210 and 212 while concurrently decoding/displaying the previously-stored content. After tuning to the next content, control circuitry 230 may again store one or more frames from the next content and immediately initiate a subsequent content tune (e.g., the subsequent channel in the direction of surfing) while displaying the newly-stored frames. This pipelined tuning process may eliminate or reduce the delays associated with content switching because

only one or more frames are stored to memory **234** rather than waiting to decode an entire content stream or signal.

For example, to decode a typical MPEG-2 content stream and begin displaying it on display device **240**, two I-frames are typically received. Once two I-frames are received, bi-directional predictive frames (“B-frames”) may be decoded using motion-compensation prediction from both a past and future reference. Thus, the decoding delay may be a function of the time between I-frames in the MPEG-2 content stream. If a user, on average, switches to a new content stream midway during the interval between two I-frames, the stream display process may not begin until at least one and a half I-frame cycles later. Depending on various factors, such as the compression used, the I-frames cycle period may be on the order of seconds in some media systems. During this time, display screen **240** traditionally remains blank until the new stream can be successfully decoded and presented on display device **240**.

By implementing a pipeline tuning sequence, if the user equipment determines that a user wishes to content surf, the user may be quickly presented with one or more frames of content per channel until the user terminates the content surf. Additionally or alternatively, other stored content, such as stored video, audio, or advertising, may be displayed while the user is content surfing. In this way, the user is presented with little or no blank screen time while surfing through content.

If user equipment **200** includes two or more tuners **210** and **212**, these tuners may be involved in a round-robin pipeline tuning process. For example, if a user initiates a content surf up from channel **1**, tuner **210** may briefly tune to channel **2** while control circuitry **230** stores one or more frames of content from channel **2** to memory. The next tuner in user equipment **200** (e.g., tuner **212**) may immediately tune to channel **3**, while tuner **210** tunes to channel **4**. As each channel is briefly tuned, only one or more frames of the content are stored to the user equipment. After storing the one or more frames, control circuitry **230** may immediately initiate a next content tune. While tuning and saving the one or more frames of the next content, control circuitry **230** may simultaneously decode and display, on display device **240**, the previously stored content from one or more of tuners **210** and **212**.

In some embodiments, tuning may not proceed in a strictly sequential order. For example, a fixed or variable number of channels may be skipped (preferably in the direction of surfing) during a content surf. This mode may sometimes be referred to as content “skip mode” herein. Rather than tuning and displaying each channel or content in sequential order, one or more of tuners **210** and **212** may tune, decode, and display every Nth channel, whereas the value N may be user or system-selected. This process may be combined with the pipeline tuning process described above, whereby one or more frames of every Nth channel are saved to the user equipment and presented to the user, rather than decoding the entire stream. The first three steps of a simplified, illustrative example is shown below in Table 1.

TABLE 1

An illustrative pipelined skip mode surfing sequence.		
Step	Tune/Acquire	Display
1	Tune and save frame(s) of first content	
2	Tune and save frame(s) of Nth content	Display frame(s) of first content

TABLE 1-continued

An illustrative pipelined skip mode surfing sequence.		
Step	Tune/Acquire	Display
3	Tune and save frame(s) of next content (first + N + N)th channel	Display frame(s) of Nth content

In one embodiment, the value of N may be a function of some user interaction with the user equipment. For example, the length of time a user presses and holds a channel up or down button on user input device **220** may cause the value of N to change (e.g., increase). The number of repeated selections of a channel up or down button may also cause the value of N to change. For example, if the user continuously or repeatedly presses a channel up or down button on user input device **220** for three seconds, control circuitry **230** may cause a tuner in the user equipment to start tuning to every other content (e.g., N=2). After three more seconds of continuous or repeated pressing, control circuitry **230** may increase the value of N and tune to every fifth content (e.g., N=5), and so on. The number of seconds of repeated selection or continuous pressing to effect a change in the value of N may be defined in user preferences or a user profile (as described below in regard to FIG. 6) or by system default parameters. Interruption in the cycle or a change from a continuous press to a repeated selection may change the value of N back from 5 to 2, for example. In some embodiments, a switch from a continuous press on a channel up or down button on user input device **220** to a repeated selection is detected by control circuitry **230**. In these embodiments, control circuitry **230** may enter or exit skip mode as the user changes the type of interaction (e.g., continuous press or repeated selection) with the user equipment. Note that in the case of multiple tuners, in some embodiments pipeline tune skip mode can be combined with multiple tuner pipeline tune features to improve performance further.

FIG. 3 shows illustrative display screen **300** displaying mini-guide **304** during a content surf. In some embodiments, pipeline tuning (and pipeline tuning in skip mode) may be enhanced with a media guidance application content listing technique. When the interactive media guidance application detects that a user is interested in content surfing, the media guidance application may initiate a pipeline tuning sequence. As described above, while content surfing the control circuitry may display one or more stored frames of content (sequentially) in content area **302** concurrently with tuning to the next content. This process may be repeated for subsequent content (e.g., the next channel in the direction of the content surf). In some embodiments, during a content surf, a grid or table of content listings may be displayed in the flip bar area of display screen **300**. This grid or table may be presented in the form of a mini-guide, such as mini-guide **304**. The content listings in mini-guide **304** may include listings associated with content ahead of the user’s current progress in the content surf, so that the user may anticipate upcoming content.

In some embodiments, the interactive media guidance application may automatically scroll or update the listings in mini-guide **304** based on the user’s progress in the content surf. For example, in FIG. 3, one or more frames from channel **23** may be presented in content area **302** while content listings for channels **24** through **28** are displayed in mini-guide **304**. In some embodiments, after the user remains in surfing mode for some user or system-specified length of time, mini-guide **304** may include information further ahead of the user’s

progress in the content surf (e.g., channels **50 -55**) in order to anticipate the user's surfing interests or ultimate landing channel.

Mini-guide **304** may be useful when the interactive media guidance application determines that the user may be interested in moving quickly up or down through the content selections to see what is currently being presented on each channel, but the user is either unaware or not interested in switching to the sequence that would enter the full content guide grid associated with the interactive media guidance application. When a user sees a listing of interest in mini-guide **304** ahead of the content surf, the user may terminate the content surf request at the desired position in the surf. Alternatively, the user may input a channel number displayed in mini-guide **304** to automatically terminate the content surf and be presented with the desired content.

In some embodiments, while surfing through available content, display screen **300** may include content bar **306**. Content bar **306** may include any suitable program information, such as the current channel number (e.g., "**23**"), channel name (e.g., "FOX"), time, and content name. For example, the information in content bar **306** may be related to content from channel **23** while the tuner is simultaneously acquiring and saving one or more frames of content from channel **24** (or channel **23+N**, in skip mode). Thus, the information displayed in content bar **306** may correspond to the one or more frames of video currently being displayed in content area **302** (and not the content currently being tuned).

In some embodiments, while a user is surfing through content, mini-guide **304** and/or content area **302** may change from a graphical view to a display that conveys or emulates a quick channel up or channel down process. For instance, if the control circuitry determines that the user wants to surf quickly in one direction, the tuning process may be effectively bypassed and the display in content area **302** may be replaced by a graphical display that shows a quick scrolling through content or channels. The graphical display may include, for example, a blurred image that is synthesized to appear like a fast tuning process (e.g., $\frac{1}{2}$ second clips of pre-stored, low-resolution content in a circular buffer). This pre-stored buffer may be displayed and the information in content bar **306** may continue to be updated to reflect the user's progress in a simulated tuning sequence. When the user terminates the content surf, the pre-stored buffer displayed in content area **302** may be replaced with content associated with a landing channel of the surf.

In some embodiments, predictive tuning may be employed. The content surf landing channel (i.e., the content the display ultimately settles on) may be anticipated by the control circuitry or the interactive media guidance application. If the landing channel is anticipated, the channel may be tuned in advance so that when the user terminates the content surf (e.g., when the user releases the channel up or channel down button), an effective "fast tune" may be accomplished. For example, if the control circuitry anticipates that a user's landing channel will be channel "**27 MTV**," this channel may be tuned in advance (perhaps at the start of a content surf) while the display shows buffered video from the last channel or an emulation of a fast surf. If the anticipated landing channel is not exactly the channel the user has stopped on, but within some user or system-specified range (e.g., five channels), the control circuitry may display the anticipated channel anyway. The user may then channel up and down from the landing channel to the desired channel, as usual.

Channels may be anticipated based on a variety of factors. For example, user history data may be tracked and logged to the user equipment or a network location. From this history

data, the control circuitry (or an interactive application running on the control circuitry) may build a table of the most frequently-tuned channels and content and the duration of time the content was displayed on the user equipment. From this information it can derive appropriate landing channels. As another example, anticipated landing channels and content may include channels and content added to one or more favorites lists or user profiles, such as the user profile described in more detail below in regard to FIG. **6**.

In some embodiments, hints may be presented to the user while content surfing. For example, as shown in FIG. **4**, display screen **400** may show hint **402** to the user. This embodiment may be helpful in teaching the user how to effectively use the interactive media guidance application by providing guidance suggestions. These suggestions may include any suitable instruction related to content changing, content surfing, ways to find content quicker, details of the search system operation, or the use of an interactive media guidance application. As shown in the example of FIG. **4**, hint **402** may include "to see a list of the channels and programs, simply press the GUIDE button" and other similar suggestions. To view more hints, the user may select "more hints" selection **404** using any available input device. Alternatively or additionally, hints may be automatically displayed by pressing a suitable button while content surfing (e.g., a "hints" button) on a user input device.

In some embodiments, the interactive media guidance application may also present a content selection menu or overlay to the user while content surfing. For example, FIG. **5** shows display screen **500** with content selection overlay **502**. After the interactive media guidance application determines that the user has been content surfing for some user or system-specified length of time, content selection overlay **502** may be displayed to the user. Content selection overlay **502** may ask the user to enter a channel number. Content selection overlay **502** may not interfere with the content surfing sequence, but merely provide an alternative method for accessing the content that the user wishes to access. Content selection overlay **502** may include channel entry area **504**. The user may enter a channel number into channel entry **504** using any available input device, including input device **108** (FIG. **1**). Upon entering a valid channel number, the user equipment may tune directly to the selected channel.

The interactive media guidance application may also provide content suggestions. Whereas content selection menus and overlays merely provide the user an alternate method for accessing content, content suggestions provide tailored listings of content that the user equipment determines that the user may be interested in watching. Content suggestions are based, at least in part, on user preferences, user profile data, user behavior (including recent surfing or scanning behavior, as well as dwell time and surf interaction responses to content previously surfed), or user history. As used herein, "user profile data" explicitly includes user preferences, user behavior data, and user history data. For example, FIG. **6** shows an illustrative favorite channels display screen and FIG. **7** shows an illustrative user profile display screen. Both of these display screens may create and/or update user profile data, which may be saved to the user equipment (or a network location such as content source **130** of FIG. **1**) and used to suggest content to the user. Each user accessing the user equipment may have a personal favorite channels list and/or user profile, or there may be a single favorite channels list and/or user profile list for all users accessing the user equipment.

Favorite channels display screen **600** may include at least list name **602** and favorite channels list **604**. If multiple favorite channels lists are used in a single system, each list may be

given a unique identifier (e.g., name) for list name **602**. A user may add and remove channels to favorite channels list **604** in a variety of ways. For example, the user may press a “Favorites” button on user input device **220** (FIG. **2**) to automatically add the channel currently being presented on display device **240** to favorite channels list **604**. Users may also add channels directly from favorite channels display screen **600**, if desired. To add a new favorite channel directly from favorite channels display screen **600**, the interactive media guidance application may present a listing of available channels to the user (not shown). This listing may be derived, at least in part, from interactive media guidance application data. The user may select any channel from the listing of available channels and press a “Favorites” button on user input device **220** (FIG. **2**).

For ease of navigation, favorite channels list **604** may be sorted by channel name or channel number. Upon selecting sort option **606**, the sort order may be toggled. To remove channels from favorite channels list **604**, the user may select delete button **608** while selecting an entry in favorite channels list **604**. In some embodiments, the channels in favorite channels list **604** may be pre-populated with the user’s most frequently or recently accessed channels. The user may then customize the list using favorite channels display screen **600**, if desired.

Upon selecting accept changes button **610**, the interactive media guidance application may create or update the user’s favorite channels in favorite channels list **604** to memory **234** (FIG. **2**). The channels list may be saved in any convenient manner, such as, for example, as a file or a table in a relational database. If the user equipment supports multiple favorite channel lists, then the list may also be associated with the current user.

To further customize a user’s content preferences, the user may create or update a user profile. As shown in FIG. **7**, user profiles may include user content preferences, such as, for example, favorite programs list **702** and favorite genre list **704**. A user may be presented with user profile creation display screen **700** in number of ways. For example, a user may press a suitable button on input device **220** of FIG. **2** (e.g., a “Profiles” button). A user may also be linked to user profile display screen **700** from another interactive application display screen.

The user may add, remove, or reorder any of the entries in lists **702** and **704**. In favorite programs list **702**, the user may define a list of the user’s favorite programs accessible by the user equipment. Upon selecting add another link **703**, interactive media guidance application data may be accessed to present a list of all available content (e.g., broadcast television programs, on-demand content, and recorded content) to the user (not shown). The user may then select the user’s favorite programs for inclusion into favorite programs list **702**. In some embodiments, favorite programs list **702** may be pre-populated with the user’s most frequently or recently accessed programs.

Similarly, the user may add, remove, or reorder content genres in favorite genre list **704**. The list of genres in favorite genre list **704** may also be pre-populated with the genres of the user’s most frequently or recently accessed content. In the example of FIG. **7**, the genres “music,” “crime,” “sports,” and “drama” are included in the user’s favorite genre list. To add another genre, the user may select add another link **706**. Upon selecting add another link **706**, the interactive media guidance application may link to interactive media guidance application data to present a list of available genres (not shown) to the user. The user may select one or more genres in the list for inclusion in favorite genres list **704**. In some embodiments, in order to determine the genre of content, the interactive media

guidance application may access extended content information from a suitable data source (e.g., data source **142** of FIG. **1**). In other embodiments, genre information may be available as part of standard interactive media guidance application data.

Some genres may be associated with genre details used to further define the genre. For example, if the sports genre is added to favorite genre list **704**, the user may additionally select to set up genre details by selecting details link **705**. Upon selecting details link **705** genre detail display screen **800** (FIG. **8**) may be presented to the user.

The lists in profile display screen **700** may be ordered or unordered. If the user desires to create an unordered list, each entry in the list may be assigned the same weight, or rank. If one or more of the lists is ordered, then weights may be assigned to each entry in the list based on its placement in the list. For example, a program listed in the first slot in favorite programs list **702** may be assigned a higher weight, or rank, than programs in lower slots in favorite programs list **702**. In this way, a user may prioritize content within the same list.

To discard profile display screen without saving changes, the user may select cancel button **710**. To accept the changes as displayed in user profile display screen **700**, the user may select accept changes button **714**. Upon selecting accept changes button **714**, the user’s profile data may be created or updated. In some embodiments, user profile data is updated and stored in memory (e.g., in a file or table in a relational database in memory **234** of FIG. **2**) on the user equipment. In other embodiments, user profile data is stored in memory at a network location (e.g., at content source **132** or data sources **140**, both of FIG. **1**). Profile data may be retrieved from the network location and cached to the local user equipment upon logging into the user equipment, if desired.

The user may also select other criteria to include in the user’s profile. Upon selecting other criteria button **712**, a user may be presented with a list of optional profile criteria (not shown). Optional profile criteria may include other content attributes, such as ratings information, artist/actor information, director information, or any other suitable content information. For example, a user may prefer R and PG-13-rated content over G and PG-rated content. By adding “R” and “PG-13” to a favorite ratings list (similar to lists **702** and **704**), a user may associate one or more preferred ratings with the user’s profile. Similarly, other suitable information may be stored in the user’s profile. For example, if the user loves the actor Tom Cruise, but dislikes the actor Jim Carey, a user may add Tom Cruise and Jim Carey to a favorite actors list and a least favorite actors list, respectively. Actor, artist, and director names may be retrieved from a suitable content or data source (e.g., content source **142** of FIG. **1**).

The control circuitry may access the user profile data associated with user profile display **700** at any suitable time. For example, the control circuitry may read a user’s profile data in anticipating a content surf landing channel. In determining which channels may be anticipated landing channels, the channel as well as the content currently be presented on the channel may be used to calculate an anticipation score for each channel (or a subset of channels), as described in more detail below. For example, if one of the user’s favorite programs listed in favorite programs list **702** is being presented on channel **100**, and the user is surfing up toward channel **100**, the system may anticipate a landing channel of **100** (even if the actual landing channel was not **100**).

To determine which channel or channels may be anticipated landing channels, an interactive application (such as an interactive media guidance application) may compute a weighted anticipation score for channels based on, at least in

part, the user's profile data and the content currently being presented on the channel. This anticipation score may reflect how likely the user is to stop on that channel. For example, based on user profile data, anticipation scores of 22, 26, 31, 35, and 50 may be assigned to channels **21** through **25**. Channel **25** may correspond to HBOE, which happens to be showing the Sopranos, the user's favorite program listed in favorite programs list **702**. If channel **26** (HBOE) is also in the user's favorite channels list, this channel may be associated with a higher anticipation score than channels not showing one of the user's favorite programs (and not listed in the user's favorite channels list). This channel may be therefore classified as an anticipated landing channel for a given channel range. In one embodiment, anticipation scores may be assigned to channels using the equation:

$$AS = \sum_{i=1}^N w_i p_i \quad (\text{EQ } 1)$$

where N is the number of profile attributes used in the anticipation score (AS) calculation, w_i is the weight (or rank) within the profile attribute, and p_i represents the value of the profile attribute to the user. For example, if the user assigns a value of 10 to the favorite program profile attribute (i.e., $p_i=10$), then weights (w_i) may be assigned to the content within favorite programs list **702**, depending on the content's position in the list. For example, a weight of 1 may be assigned to the first (favorite) entry in the list, a weight of 0.9 to the next (next favorite) entry in the list, etc. Therefore, if Sopranos is showing on a channel, that channel may receive 10 favorite program points, while a channel showing CSI-Miami may receive 9 favorite program points. The total anticipation score may be the sum of all the points derived from profile attributes currently in the user's profile.

Anticipation scores may also be derived, at least in part, from user history information or past interaction with the user equipment. The interactive media guidance application may store recent user history information in memory **234** (FIG. **2**). This user history information may then be used to augment a channel's anticipation score. For example, content on channels that the user has previously paused on during a recent content surf may be credited anticipation score points based on, for example, the duration of the user's pause on that content or channel. Anticipation score points may also be credited based on other criteria. Channels showing content that the user has recently watched, or obtained more information on (e.g., the user recently accessed the content's description or program information), may be credited with anticipation score points. Channels showing content that the user has added to one or more "watch lists" or set one or more notification alerts for may also be credited with anticipation score points, if desired. Finally, channels showing content that the user has recently recorded (or set a recording reminder for) may also be credited with anticipation score points. In this way, a channel's total anticipation score may be based on user profile data and user history information.

In some embodiments, anticipation scores may be dynamically adjusted during a content surf. For example, a channel's anticipation score may also be a function of the user's current distance from the channel in a content surf. For example, even though channel **25** may be associated with an anticipation score of 50, this channel may not be the user's desired landing channel depending on how far away from channel **25** the user is at the conclusion of a content surf. Accordingly, antici-

tion scores may be dynamically adjusted as the user's surf progresses. The anticipation score associated with channel **25** may decrease as the user surfs farther away from channel **25** and increase as the user surfs closer to channel **25**. In some embodiments, the rate of decrease (i.e., penalty) or increase (i.e., benefit) may be linear or quadratic and may be set by the user, if desired.

In addition, in some embodiments, a maximum channel range may be associated with each anticipation score. If the user surfs beyond the maximum channel range, the anticipated landing channel may be removed from the list of possible anticipated landing channels (e.g., the anticipation score may be reduced to 0). The maximum channel range may be fixed for all anticipation scores or a function of the value of the anticipation score. Thus, higher anticipation scores may be associated with larger maximum channel ranges than lower anticipation scores. In the example above, the channel associated with the anticipation score of 50 may be assigned a maximum channel range of 20, while the channel associated with the anticipation score of 22 may be assigned a maximum channel range of 5.

If genre details are enabled, the interactive media guidance application may also use any genre details in the user's profile to calculate anticipation scores. For example, as shown in FIG. **8**, genre details display screen **800** may include more information about a particular genre included in the user's favorite genre list. The example of FIG. **8** displays a sports genre detail display screen. However, other genre details may be provided. For example, a music genre display screen (not shown) may allow the user to define a favorite musical artist, music video choreographer, or any other suitable information. This information may be saved with the user's profile.

Genre details display screen **800** may include common details for the sports genre. In favorite sport selection **802**, the user may define one or more favorite sports. In favorite team selection **804**, the user may define one or more favorite teams. In favorite player selections **806** and **808**, the user may define one or more favorite players. In some embodiments, favorite player selections **806** and **808** list the players associated with the team selected in favorite team selection **804**. In other embodiments, all players, regardless of what team they are on, are listed in favorite player selections **806** and **808**. The user may add additional players (from the same or different teams) by selecting add player link **810**.

In order to populate the selections in display screen **800**, including favorite sport selection **802**, favorite team selection **804**, and favorite player selections **806** and **808**, the interactive media guidance application may access up-to-date team roster information from a suitable genre detail data source (e.g., data source **142** of FIG. **1**). The interactive media guidance application may then use the user selections in genre details display screen **800** to augment the user's profile data. Similar to the selections in user profile display screen **700** (FIG. **7**), weights may be assigned to the selections in genre details display screen **800**. These weights may then be used by the interactive media guidance application to calculate channel anticipation scores using EQ. 1. A channel's anticipation score may be indicative of how interested the user would be in accessing the content on the channel.

Anticipation scores may also be used to suggest content to the user. In some embodiments, as the user content surfs, suggestions of content that may be of interest to the user (and are currently or shortly accessible by the user equipment) are presented to the user. Content of interest may include content on channels with high anticipation scores. For example, if the user is a CSI fan (based on prior profiling, such as the inclusion of CSI in favorite programs list **702** (FIG. **7**)), the inter-

active media guidance application may consult a category or genre database that looks for any accessible content that is in the same category or genre as CSI. Currently accessible content may include programs, movies, and sporting events that are currently being broadcast on one or channels, starting within some user or system-defined time (e.g., 30 minutes), content available on-demand, and content available on one or more of the user's attached recording devices (such as recording device 260). A listing of content of interest may be presented in a non-obtrusive manner to the user, such as quick menu 902 of FIG. 9 (described in more detail below).

In the example of FIG. 8, the user has selected "baseball" as the user's favorite sport and "New York Yankees" as the user's favorite team. Therefore, if a user initiates a content surf while a New York Yankees baseball game is currently accessible (or about to be accessible, for example, on the YES network), the interactive media guidance application may add a link to this game in a content suggestions menu. Interactive media guidance application data from a suitable data source may be used to determine which channels are currently presenting content matching the genre detail.

As shown in FIG. 9, display screen 900 may include a content suggestions menu, such as quick menu 902. In some embodiments, quick menu 902 is presented after the user has been content surfing for a user or system-specified period of time. The presentation of quick menu 902 may not interfere with the content surf. Thus, the user may be allowed to continue surfing to new channels or content while quick menu 902 is displayed. Quick menu 902 may include one or more quick dial content listings of interest, each associated with a quick dial number and, optionally, a status indicator. Status indicators may include "new," "repeat," the source of the content (e.g., "VOD" or "DVR"), or any other suitable information. The user may enter any quick dial number displayed in quick menu 902 and be tuned directly to the content associated with the quick dial number. Quick dial numbers may be entered into quick dial entry 904. Alternatively, the actual channel numbers associated with the content displayed in quick menu 902 may be used as the content's quick dial number and entered into quick dial entry 904. In some embodiments, quick menu 902 may time out after the user pauses his surfing for a specified period of time.

In some embodiments, when a user presses a quick dial number on a user input device while quick menu 902 is displayed, more information about the program corresponding to the quick dial number is displayed in flip bar area 906. For example, the content start and end time (if applicable), the content rating, a content description, or any other suitable information may be presented to the user.

In one or more embodiments, programs may be promoted or advertised in quick menu 902. For example, the programs suggested in quick menu 902 may be determined, at least in part, as a function of those programs that the cable or multiple service operator (MSO) wants to promote. The promotion may be part of a business model wherein the operator collects additional fees or revenue from the associated networks based on a desired level of promotion. For example, the FOX network may wish to aggressively promote one or more new television series. These series may be displayed higher (or otherwise more prominently) in quick menu 902 to help increase visibility (and user selection). Additionally, some graphic or other attention-grabbing icon or indicator may be displayed next to the content name, if desired. For example, a thumbnail icon of the content or a star icon may be positioned next to the content name in quick menu 902.

In some embodiments, quick menu 902 may also be combined with skip mode. For example, rather than present a still

frame or video as a user surfs through content, the control circuitry (or interactive media guidance application) may determine in advance content of interest to the user in the forward direction of the content surf. The skip value (i.e., the value of N as described above) may be dynamically adjusted to skip to the next channel or content of interest. For example, assuming that based on the user's profile data (e.g., favorite genres list 704 of FIG. 7) the user is interested in the sports and music genres, then the value of N could be adjusted dynamically so that only sports and music channels (or channels currently presenting sports or music content) are tuned. For example, if the channels MTV and VH1 correspond to channels 44 and 45, respectively, and the channels ESPN and CBS (which happens to be airing a basketball game at the time of surfing) correspond to channels 81 and 123, respectively, the channel skip value may be adjusted to land on these channels. So, for example, if the user then starts to surf down from channel 150, rather than presenting a still frame of video, the control circuitry may pipeline tune to channels 123, 81, 45, and 44.

In addition to using profile data to dynamically adjust the value of N, information associated with the content being presented on the user equipment just prior to the content surf may be used. For example, if the user was watching a basketball game prior to initiating a surf, then the sports genre may automatically be added to the search criteria. Additionally or alternatively, the sports genre detail may be automatically created to add basketball to the user's favorite sport in favorite sport list 802 (FIG. 8). In this way, a user may quickly tune to other similar assets accessible by the user equipment without navigating to the full interactive media guidance grid.

In some embodiments, while the user is content surfing, locally stored text or graphic advertisements may be overlaid on the screen. These advertisement overlays may be presented by themselves or in combination with the hints or content suggestions, described above. In some embodiments, advertisements may replace parts of flip bar area 906. In other embodiments, the advertisements may be shown in the main display window while the user content surfs. While advertisements are being displayed, the user may retrieve one or more pages of additional information related to the advertisement by selecting an "Info" button on user input device 220 (FIG. 2). Links to order entry forms and purchase information may also be provided.

For example, a hyperlink to a webpage may be included in flip bar area 906. If the user is interested in obtaining more information about the advertisement, the user may select the hyperlink and directly access additional information. The user may also press a "Save" button on user input device 220 to cache a copy of advertisements of interest to the user's personal space (e.g., the user's personal directory) on the user equipment. This way, the user may view the advertisement at a later time in more detail. Alternatively or additionally, upon pressing the "Save" button while an advertisement is being displayed, the user equipment may automatically record a video related to the advertisement to memory 234 (FIG. 2). The user may then access the video at a later time.

In combination with one or more of the previous embodiments, audio, either associated with specific programs of interest that are skip-tuned, audio that is used to train or provide hints of programs of interest to the user based on the user's profile, or audio associated with advertisements that have been locally stored, may be played while content surfing. The audio may include digital music selections and compilations (e.g., in MP3 format). In addition, the audio may include user audio selections that the user has transferred to the user equipment (or an attached storage or recording

device). For example, digital audio clips from a digital audio player may be transferred to the user equipment and custom audio may be played. As another example, instead of transferring the audio content to the user equipment, the content may be played or streamed directly from an attached (or 5 coupled) digital audio device or player.

Since a user may pause briefly on multiple channels or content during a content surf, in some embodiments, a visual representation of where the user has paused may be presented to the user. As shown in FIG. 10, this visual representation may include a thumbnail window of each recently paused on 10 channel or content during the current content surf. Thumbnail windows **1002**, **1004**, and **1006** may represent the user's last three paused on channels or content. In the example of FIG. 10, this content corresponds to channel **100**, channel **231**, and channel **234**. Thumbnail windows **1002**, **1004**, and **1006** may include one or more still frames, still graphics, animated graphics (e.g., animated gifs) or video loops of the paused on content. The still frames or graphics may be the same one or more frames stored in memory on the user equipment while 20 implementing the pipeline tuning sequence or even a video loop created from the stored frames.

In creating thumbnail windows **1002**, **1004**, and **1006**, graphics circuitry **250** (FIG. 2) may reduce the native size or resolution of any of the tuner inputs (or other content, such as 25 one or more frames of video stored on the user equipment), and present this scaled output on display screen **1000**. The user may then enter a channel number (or quick dial number) associated with the thumbnail window or select the thumbnail itself to terminate the surf and tune to the associated channel or content. In some embodiments, to save memory, the frames are resolution reduced and then recompressed using an alternative high compression algorithm (e.g., MPEG-4 part 10) and then decompressed and displayed on the fly concurrently with the other "previously accessed" content windows. In 35 some embodiments, the visual representation of the user's most recently paused on channels or content may not interfere with the user's content surf. Thumbnail windows **1002**, **1004**, and **1006** may be presented in a grid with or without brief descriptions of each thumbnail (e.g., the name of the content, the associated channel number, the quick dial number, or any other suitable information).

In some embodiments, rather than displaying a frozen image or frame of the most recently paused on content, while a user is content surfing the tuner may persist on the most 45 recently paused on content, tuning to the next content or channel only when the user next pauses the surf. In these embodiments, live video corresponding to the previously tuned (or paused on) content may be presented in the background as the user surfs and until the user pauses again. If 50 more than one tuner is available in the user equipment, the last N previously tuned content or channels may be displayed in live video. Display screen **1000** may include some indication that the video presently being displayed is previously tuned content. For example, the video may be reduced in size, brightness, or resolution. Additionally or alternatively, flip bar area **1010** may continue to be updated as the user's content surf progresses while the previously tuned video is displayed in thumbnail windows **1002**, **1004**, and **1006**.

As shown in the example of FIG. 10, the user may have 60 paused on channel **100**, channel **231**, and channel **234**. The user may be currently paused on channel **237**, which is reflected by the information in flip bar area **1010**. Recently tuned menu **1008** may display a listing of the content or channels the user has previously paused on, along with the channel or quick dial number associated with the content. The user may enter the virtual channel or quick dial number into

menu entry **1012** or select one of thumbnail windows **1002**, **1004**, and **1006** to terminate the surf and be tuned directly to the appropriate content. After some timeout period, both recently tuned menu **1008** as well as thumbnail windows 5 **1002**, **1004**, and **1006** may disappear (optionally to be presented again, if desired, in the future) and the user may be returned to full screen video mode (with or without flip bar **1010**, having its own timeout).

In some embodiments, instead of showing recently paused on content in thumbnail windows **1002**, **1004**, and **1006**, these 10 windows may present content suggestions or content of interest to the user. These embodiments may be considered a visual version of quick menu **902** (FIG. 9) where the suggested content is displayed as a video loop or one or more still frames instead of in a suggestion menu. Thumbnail windows **1002**, **1004**, and **1006** may be populated in the direction of the content surf, as the user surfs past a suggested channel, or in 15 advance or reaching a suggested channel. In some embodiments, the thumbnails may additionally or alternatively include jacket art associated with the suggested content, if such jacket art is available from a suitable data or content source (e.g., content source **130** or data source **142** of FIG. 1).

FIG. 11 shows illustrative display screen **1100** in which a user has initiated a content surf in accordance with one 25 embodiment of the invention. Upon initiating a content surf, the content the user was watching before the surf was initiated may change to reflect that the content is now historical (though it may still be tuned and playing live). For example, in thumbnail window **1102** the Sopranos on channel **100** has been moved to small thumbnail window **1102**, but continues to play. Main video window **1108** may emulate a fast surfing or tuning action. Recently tuned menu **1104**, which may include recently tuned menu entry **1106**, may be populated with an entry for each recently tuned content or channel 35 during the current content surf. The video from channel **100** may be displayed until the user pauses the content surf on a new channel or content, at which time main video window **1108** may fill with video from the newly paused on channel (e.g., channel **231**). While the video is being acquired, content tuning message **1110** may be displayed to the user. This message may indicate to the user that main video window **1108** will present the newly paused on channel shortly. In one 40 tuner systems, thumbnail window **1102** may then freeze since the user is tuned away. In multiple tuner systems, thumbnail window **1102** may continue to display full motion video. If the user starts to surf again within a user or system-selected time period, the motion video window from channel **231** may move into position in a thumbnail size under thumbnail window **1102** and continue playing until the user again pauses, at 45 which time it may also freeze. This process may continue until the user exits or terminates the content surf (e.g., by pressing a "cancel" button on a user input device or waiting a user or system-specified surf timeout period).

In systems with more than one tuner, the tuners may be 55 used in a round-robin fashion so that a number of most recently tuned (or paused on) channels up to the number of tuners present in the user equipment are displayed simultaneously in full motion video. For example, in display screen **1000** (FIG. 10), tuners **1** through **3** may be tuned to recently tuned channels **100**, **231**, and **234**, which are displayed in thumbnail windows **1002**, **1004**, and **1006**, respectively, in full motion video. A fourth tuner may be tuned to the currently paused on channel (e.g., virtual channel **237**), which may appear in the large main video window. In this way, each 65 tuner may be displaying motion video as opposed to one or more frames or a pre-stored video clip. If only three tuners are available, either the number of recently viewed windows may

be reduced or the oldest of the recently viewed windows can be filled with a still or graphic as described earlier.

FIG. 12 shows illustrative process 1200 for detecting a content surf. As described above, content surfs may be initiated in a number of ways. At step 1202, the user may tune to a first content selection in a series of content selections. For example, the user may tune to a broadcast television or on-demand channel. The user may also access a content selection stored on an attached recording device, such as recording device 260 (FIG. 2). At decision 1204, control circuitry 230 (FIG. 2) may determine if an explicit content surf input has been received. An explicit content surf may include a user selection of a “content surf up” or “content surf down” button on user input device 220 (FIG. 2), for example. If the control circuitry does not detect an explicit content surf request at decision 1204, the control circuitry may determine if the user has repeatedly requested a content tune at decision 1206. For example, the user may repeatedly press a traditional channel up or channel down button on user input device 220 (FIG. 2) for a system-defined threshold period of time. For example, after repeatedly pressing a traditional channel up or channel down button for 10 seconds, control circuitry 230 (FIG. 2) may determine that a content surf was requested at decision 1206. If the control circuitry does not detect a repeated content tune, at decision 1208 control circuitry 230 (FIG. 2) may determine if a continuous content tune request has been received. A continuous content tune request may include, for example, pressing (and holding) a traditional channel up or channel down button on user input device 220 (FIG. 2) for a system-defined threshold period of time.

If, at decision 1208, it is determined that the control circuitry has not received a continuous content tune request, control circuitry 230 (FIG. 2) may initiate a traditional content tune at step 1210. If, on the other hand, the control circuitry detects any of the events associated with decisions 1204, 1206, and 1208, the control circuitry may initiate a content surf at step 1212.

In practice, one or more steps shown in process 1200 may be combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously), or skipped. For example, decisions 1204, 1206, and 1208 may be performed simultaneously, or combined into a single decision.

FIG. 13 shows illustrative process 1300 for content surfing. After a content surf request has been detected, control circuitry 230 (FIG. 2) may direct a tuner (e.g., tuner 210 of FIG. 2) to tune to the next (e.g., the second) content selection in the series at step 1302. The next content selection in the series may include the next available channel in the direction of the content surf. For example, if a user is content surfing up from channel 24 ABC, tuner 210 (FIG. 2) may tune to channel 25 NBC. As another example, if a user is currently accessing content from an attached recording device (e.g., on recording device 260 (FIG. 2)), the next content selection may include, for example, the next content in alphabetical order (by file name or content name) or the content stored in the next physical location on the recording device.

After the second content selection has been tuned at step 1302, one or more frames of the second content may be buffered at step 1304. Buffering frames of content may include caching or saving these frames to memory 234 (FIG. 2). After buffering the one or more frames of content at step 1304, control circuitry 230 (FIG. 2) may direct tuner 210 (FIG. 2) to tune to the third content in the series, at step 1306, while the one or more buffered frames of the second content are simultaneously displayed on display device 240 (FIG. 2). At decision 1308, the control circuitry may determine if the

user has terminated the surf request. If so, the buffered frames may be discarded and the landing content of the surf may be presented to the user at step 1310.

If, at decision 1308, the control circuitry still detects a channel surf request, the channel surfing process may return to step 1304. The control circuitry may then buffer one or more frames of the next (e.g., third) content. This process may continue until the content surf is terminated.

In practice, one or more steps shown in process 1300 may be combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously), or skipped.

FIG. 14 shows illustrative process 1400 for selecting an anticipated landing channel of a content surf. At step 1402, a content surf request may be received. For example, the user may have selected to content surf using user input device 220 (FIG. 2). At step 1404, user history data may be read from memory 234 (FIG. 2). For example, user history may include content or channels that the user has recently paused on, watched, ordered (e.g., via an on-demand or pay-per-view (PPV) ordering process), recorded, set an alert for, or any other suitable user interaction with the user equipment. At decision 1406, the control circuitry may determine if user profile data is available. The control circuitry may determine if user profile data is available by searching a profile directory in memory 234 (FIG. 2) for a user profile data file, for example. If profile data is available, the profile data is read at step 1408. For example, the user may have created favorite channel data using favorite channels display screen 600 (FIG. 6) or favorite genre or program data using user profile display screen 700 (FIG. 7).

After reading the user profile data at step 1408, or if no user profile data is available, anticipation scores may be calculated for a subset of the currently accessible channels at step 1410. The subset of channels may include channels within a predefined number of channels from the user’s actual landing channel. For example, if the user actually issued the surf termination request at channel 210, anticipation scores may be calculated for channel within 10 channels of channel 210 (e.g., channels 200 through 220). Alternatively, anticipation scores may be calculated for all channels, if desired. Anticipation scores may be calculated using EQ 1. At step 1412, a landing channel may be tuned and displayed on display device 240 (FIG. 2) based on the anticipation scores calculate at step 1410. In some embodiments, this landing channel may be tuned and decoded in advance. For example, the channel with the greatest anticipation score may be presented to the user at step 1412, even though that channel was not the user’s actual landing channel.

In practice, one or more steps shown in process 1400 may be combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously), or skipped. For example, user history data and user profile data may be stored as a single data source in memory 234 (FIG. 2). Steps 1404 and 1408 may then be combined into a single step, if desired.

FIG. 15 show illustrative process 1500 for preparing to present content suggestions to a user. At step 1502, the user may tune to new content. For example, the user may input, using user input device 220 (FIG. 2), a new channel number. Control circuitry 230 (FIG. 2) may receive the channel input from the user input device and direct tuner 210 (FIG. 2) to tune to the appropriate channel. The control circuitry may then display the tuned content on display device 240 (FIG. 2). At decision 1504, the control circuitry may determine if the user is requesting a content surf. For example, process 1200 (FIG. 12) may be used to determine if the user has requested

a content surf. At step **1506**, user history data may be read from memory **234** (FIG. 2). As previously described, user history data may include any recent user interaction with the user equipment.

At decision **1508**, the control circuitry may determine if user profile data is available. The control circuitry may determine if user profile data is available by searching a profile directory in memory **234** (FIG. 2) for a user profile data file, for example. If user profile data is available, at step **1510**, the user profile data may be read. After the user profile data has been read, or if no user profile data exists, control circuitry **230** (FIG. 2) may determine, at decision **1512**, if the user's current content surf has exceeded some threshold surf time period. For example, if the current content surf has persisted for more than a threshold period of time at decision **1512**, illustrative process **1500** may continue in FIG. 16 by presenting a content suggestions menu. If the control circuitry determines that the current content surf user has not exceeded the surf threshold time period, the surf may continue.

In practice, one or more steps shown in process **1500** may be combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously), or skipped.

FIG. 16 shows illustrative process **1600** for presenting a content suggestion menu to the user. At step **1602**, the media guidance application data may be accessed. For example, media guidance application data may include, for example, channel listings information, content descriptions, genre information, actor information, ratings information, director information, or any other suitable information associated with content currently accessible by user equipment **200** (FIG. 2) or available in the near future. For example, in one embodiment, control circuitry **230** (FIG. 2) may analyze media guidance application data associated with broadcast television content currently being broadcast or about to be broadcast within the next 30 minutes. As another example, media guidance application data associated with on-demand and recorded content may be accessed at step **1602**.

At step **1604**, the interactive media guidance application may locate content of particular interest to the user based, at least in part, on the user profile and/or user history data read at steps **1510** and **1506** (FIG. 15), respectively. Content may be located on any accessible channel or on an attached storage device (e.g., recording device **260** (FIG. 2)). Preferably, the interactive media guidance application uses the anticipation scores calculated in process **1400** of FIG. 14 to locate content of interest to the user. For example, while a user is content surfing, the interactive media guidance application may calculate anticipation scores and present the content associated with the top anticipation scores in a content suggestion listing at display **1606**. The content listings in display **1606** should be of particular interest to the user, since the content was selected based on user history and user profile information. In some embodiments, display **1606** may correspond to quick menu **902** (FIG. 9).

The user may then be given an opportunity to select a content listing in display **1606**. At decision **1608**, the interactive media guidance application may determine if the user has selected to view content listed in display **1606**. The user may select content in display **1606** by entering a quick dial number, a channel number, or highlighting and selecting the content listing itself. The user may interact with display **1606** using user input device **220** (FIG. 2). If the user has not selected to view content listed in display **1606**, then the content surf may continue at **1610**. Thus, display **1606** may not interfere with the current content surf. If the user has selected

content from display **1606**, the content may be presented on display device **240** (FIG. 2) at step **1612**.

In practice, one or more steps shown in process **1600** may be combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously), or skipped.

FIG. 17 shows illustrative process for presenting thumbnail windows of recently paused on content during a content surf. At step **1702**, the user may initiate a content surf. The content surf may be detected using process **1200** (FIG. 12). At step **1704**, the user may pause the surf on a content selection. For example, the user may release a channel up or down button on user input device **220** (FIG. 2). If the user pauses for more than a threshold period of time at decision **1706**, the content surf may be terminated and the user may be presented with the paused on content at step **1714**.

If the user continues with the content surf after pausing on a content selection, the paused on content may be moved to a thumbnail window at step **1710**. For example, the thumbnail window may correspond to thumbnail window **1102** (FIG. 11) or thumbnail windows **1002**, **1004**, or **1006** of FIG. 10. At decision **1712**, the control circuitry may determine if the user has requested to terminate the content surf. For example, the user may terminate a content surf by selecting a thumbnail window, pressing a "cancel" button on user input device **220** (FIG. 2), or letting the timeout period elapse. If control circuitry **230** (FIG. 2) determines that the user still wishes to content surf, the user may continue the surf process and pause on one or more content selections. Each paused on content selection may be moved to a thumbnail window, as shown in FIG. 10.

In practice, one or more steps shown in process **1700** may be combined with other steps, performed in any suitable order, performed in parallel (e.g., simultaneously or substantially simultaneously), or skipped.

The above described embodiments of the invention are presented for purposes of illustration and not of limitation, and the present invention is limited only by the claims which follow.

What is claimed is:

1. A method for content surfing on user equipment, the method comprising:
 - generating a sequential display in a first area, from a list of a plurality of content selections in a content surf, of the plurality of content selections;
 - determining whether a user request to pause the content surf was received when a display is generated, in a second area, of a given one of the content selections;
 - generating a content identifier of the given one of the content selections in response to determining that the user request to pause the content surf was received when the display was generated, in the second area, of the given one of the content selections; and
 - updating the sequential display generated in the first area with another one of the plurality of content selections while maintaining the generated display of the given one of the content selections in the second area.
2. The method of claim 1, wherein the content identifier includes a content listing.
3. The method of claim 1, further comprising:
 - generating a visual representation of the given one of the content selections corresponding to the content identifier.
4. The method of claim 1, further comprising:
 - generating a display of the given one of the content selections corresponding to the content identifier.

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5. The method of claim 1, further comprising:
 receiving a user selection of the content identifier;
 terminating the content surf responsive to the user selection;
 and
 generating a display of the given one of the content selections corresponding to the selected content identifier.
6. The method of claim 1, wherein the plurality of content selections is determined based on user profile data.
7. The method of claim 1, wherein the content identifier is a first content identifier in a plurality of content identifiers, the method further comprising:
 determining whether another user request to pause the content surf was received when a display is generated of another one of the content selections;
 generating a second content identifier of the another one of the content selections in response to determining that the another user request to pause the content surf was received when the display was generated of the another one of the content selections; and
 adding the second content identifier to the plurality of content identifiers.
8. The method of claim 1 further comprising preventing the generation of another content identifier corresponding to another content selection of the plurality of content selections if a user request to pause the content surf is not received when a display of the another content selection is generated.
9. A system for content surfing on user equipment, the system comprising:
 control circuitry configured to:
 generate a sequential display in a first area, from a list of a plurality of content selections in a content surf, of the plurality of content selections;
 determine whether a user request to pause the content surf was received when a display is generated, in a second area, of a given one of the content selections;
 generate a content identifier of the given one of the content selections in response to determining that the user request to pause the content surf was received when the display was generated, in the second area, of the given one of the content selections; and
 update the sequential display generated in the first area with another one of the plurality of content selections

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- while maintaining the generated display of the given one of the content selections in the second area.
10. The system of claim 9, wherein the content identifier includes a content listing.
11. The system of claim 9, wherein the control circuitry is further configured to:
 generate a visual representation of the given one of the content selections corresponding to the content identifier.
12. The system of claim 9, wherein the control circuitry is further configured to:
 generate a display of the given one of the content selections corresponding to the content identifier.
13. The system of claim 9, wherein the control circuitry is further configured to:
 receive a user selection of the content identifier;
 terminate the content surf responsive to the user selection;
 and
 generate a display of the given one of the content selections corresponding to the selected content identifier.
14. The system of claim 9, wherein the plurality of content selections is determined based on user profile data.
15. The system of claim 9, wherein the content identifier is a first content identifier in a plurality of content identifiers and the control circuitry is further configured to:
 determine whether another user request to pause the content surf was received when a display is generated of another one of the content selections;
 generate a second content identifier of the another one of the content selections in response to determining that the another user request to pause the content surf was received when the display was generated of the another one of the content selections; and
 add the second content identifier to the plurality of content identifiers.
16. The system of claim 9, wherein the control circuitry is further configured to:
 prevent the generation of another content identifier corresponding to another content selection of the plurality of content selections if a user request to pause the content surf is not received when a display of the another content selection is generated.

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